

COAL AGE

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No. 7

The Surprise

BY BERTON BRALEY

Written expressly for Coal Age

"That pit-boss gets my goat for fair,
I hate his face an' his auburn hair
An' the way he looks an' the way he walks
An' the kind of bunk that he always talks;
If he slips me much of his funny gab
I'll poke him quick with an awful jab!"

The miner paused in his talk a bit,
While his pipe he filled and packed and lit,
"There's some," he said, "that's workin' here
Who holds the boss in deadly fear,
An 'Yessir' an' 'Nossir' is all they say
When his nibs comes flockin' around their way:
But say—if he ever gets fresh with ME
I'll show him the kind of a guy I be,
He can't get flossy with me, that's flat,
I'll show him the place to head in at,
For I knows my work an' I does it good,
As good as a pit-boss ever could,
An' if one of them guys gives me a call
I reads him the riot act, that's all."

"Hey you!" said the Boss as he came along,
"You're drillin' them holes of yours all wrong,
You're a blanketey fool of a blanketey blank
With nuthin' but mud in your thinkin' tank!
If you had the sense of a ring-tailed ape
You'd have that job in decent shape
But—"a hairy fist with a vicious clout
Came hurtling over and put him out,
And the miner said, with a pleasant smile,
"You get me, Stephen?—well, that's my style,
You can't get funny with me, because
I'm just as tough as I said I was!
I handed his to that loud-voiced slob,
An' now it's me for another job!"

That's not the way you thought 'twould end?
I'm sorry, but truth is truth, my friend!

The Stripping of Anthracite

BY E. G. LEWIS*

SYNOPSIS—A large area of the anthracite region of Pennsylvania may be successfully worked by stripping with modern steam shovels. The maximum amount of overburden which may be handled per ton of coal is about 4 cu.yd. Full revolving machines of small size may often be advantageously used for loading the coal into mine cars.

Although most of the coal from the anthracite region has been in the past, and doubtless will be in the future, secured by underground working, there are certain places where, by the use of suitable machinery, open strip pit mining may be carried on to advantage. The introduction of the modern steam shovel into this class of work has made it possible to strip from 40 ft. to 200

Construction Co., of Mount Carmel, stripping for the Philadelphia & Reading Coal & Iron Co.

A TYPICAL STRIPPING OPERATION

A description of the last named job may be of interest, since it is typical of all the others. The coal lies in a saucer-shaped basin, as indicated by the accompanying drawing. The shovel is started in on about a 10-ft. cut which allows of loading into dump cars on a track laid along the original surface of the ground. This cut is taken all the way through the work, which, in the above case, is a distance of about two miles. The second through cut is taken at a depth of about 20 ft., the loading track being shifted to the bottom of the first lift taken out.



FIG. 1. A STRIP PIT NEAR MT. CARMEL

ft. of overburden in order to uncover from 4 ft. to 30 ft. of coal, the maximum ratio being about 4 cu.yd. of stripping to 1 ton of coal.

By no means all of the anthracite district is within the limit of stripping possibilities, the coal in most places being too far below the surface. This is true of the district in and around Wilkes-Barre and Scranton and north of Carbondale. However, the region included in the area from Hazleton west to Shenandoah, Mahanoy City, Centralia and Mount Carmel, southeast to Pottsville, Tamaqua and Lansford, and north to Drifton and Jeddo, is largely a stripping proposition.

At the present time, most of the stripping is done on contract for the coal companies. Among the larger stripping operations are those of N. J. Cuyle & Son, of Hazleton, who strip for the Lehigh Valley Coal Co., the Central Penn Quarry & Stripping Co., of Harleigh, Penn., employed by G. B. Markle, and the A. E. Dick

It should be here added by way of explanation that it is only possible to take a cut of about 10 ft. and load into the standard dump car stationed on the bank alongside. On the second through cut, however, as may be seen in the sketch, loading is being done upon the same level as the shovel track and the depth of the cut is limited only by the depth at which it is possible to drill and shoot advantageously.

The second cut is carried all the way across the work, which, in this case, is about 1000 ft. This level is maintained for reasons of getting good drainage and securing a low grade for the track to the dump. It is usually possible to get to the dump from the first cut on a grade of about one-half per cent. This increases as the shovel works down deeper, the maximum sometimes being 10 and 12 per cent., in which case an incline and engine are used to haul the whole train, including locomotive, to the dumping ground.

The standard equipment on the above stripping job includes a 70-C Bucyrus shovel weighing about 85 tons

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FIG. 2. A SMALL FULL-REVOLVING SHOVEL LOADING COAL

and provided with a dipper of $2\frac{1}{2}$ cu.yd. capacity. This is mounted on railroad trucks and is self-propelling, which allows the machine to move ahead as rapidly as the material is taken out. Shovels of this type handle from 20,000 to 35,000 cu.yd. per month. The dirt train equipment is made up of 4-cu.yd. Western dump cars hauled by an 18-ton Vulcan locomotive. From 6 to 12 cars make up a train until the steep grades are encountered, when it is found necessary to diminish the number of cars in a trip considerably.

The accompanying photograph, Fig. 1, shows a portion of the A. E. Dick contract at Mt. Carmel, as described above. This picture gives a good idea of the work and its magnitude, as well as the method of procedure. The

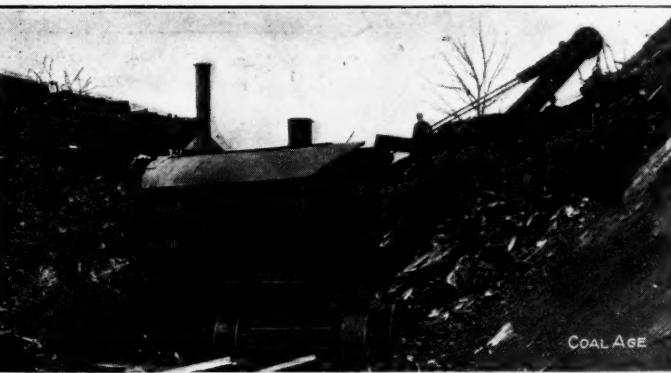


FIG. 4. A SMALL SHOVEL MOUNTED ON WIDE-TIRED WHEELS

One of the interesting operations wherein this type of machine is employed is that of the Lehigh & Wilkes-Barre Coal Co., at Green Mountain. This is shown in Fig. 2. Here the coal-loading track is maintained alongside of the shovel, while a third track is laid up to the rear of the machine, upon which an empty car is kept. Into this is loaded any rock or slate encountered during the work, thus preventing its going to the breaker or necessitating the process of picking from the car by hand. The shovel runner soon becomes quite expert in

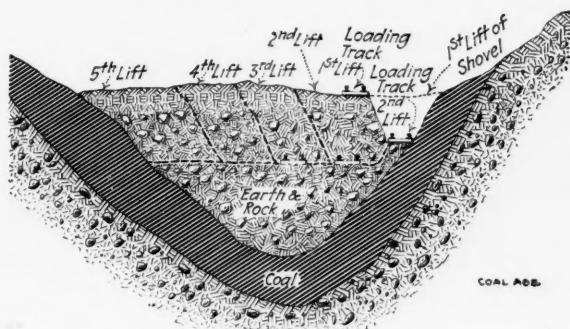


FIG. 3. CROSS-SECTION OF A STRIPPING OPERATION

shovel can be seen taking its third cut on the second lift, shown in the line drawing, Fig. 3, as lift No. 4.

SMALL SHOVELS LOAD COAL

The small revolving steam shovel has also been successfully introduced into the coal regions for the purpose of loading the stripped coal, working in culm and slate banks, ditching, etc. In coal loading, these machines have been found to decrease the cost about one-half. They also give a much better product, inasmuch as it is not necessary to break the coal up to sizes which a man can lift, as is the case in hand loading. Furthermore, it is possible to top off the cars, thereby adding about 20 per cent. to their capacity.

These shovels are full revolving and mounted on railroad trucks, of the same gage as the mine tracks. This makes it possible to shift the machine from one part of the work to another at little cost, it being self-propelling. Shovels of this type weigh about 25 tons, and carry $\frac{7}{8}$ -cu.yd. dippers.

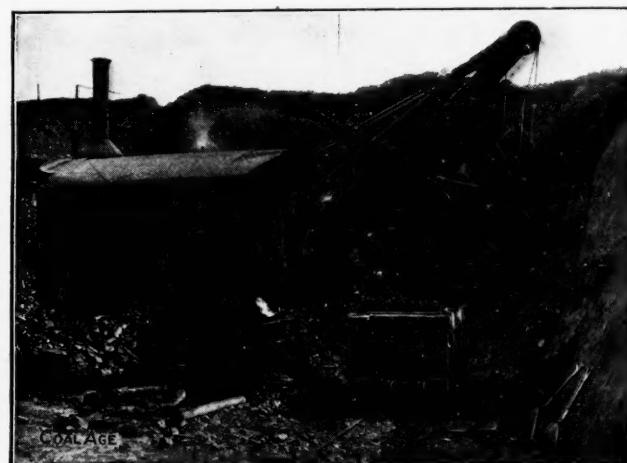


FIG. 5. A SMALL SHOVEL AT WORK NEAR HAZLEBROOK

the matter of segregating the slate from the coal.

In this work some extremely good records have been made. One report of a 9-hr. day shows that 96 cars of coal and 45 cars of slate were handled. These cars held 102 cu.ft. each, making a total for the nine hours of about 423 tons of 2240 lb.

■

Anthracite Production in Seventeenth Pennsylvania District

The total output of hard coal in the seventeenth district of Pennsylvania for 1913 amounted to 4,324,561 tons. The total number of men employed was 8540. The greater part of this coal was produced by the Lehigh Coal & Navigation Co., operating mines in Carbon and Schuylkill counties. The average number of days worked was 263. Of the total production, 521,495 tons was used at collieries and 132,060 tons sold to local trade.

A Draw-Out Mining Switch Pillar

SPECIAL CORRESPONDENCE

SYNOPSIS—A switch especially designed for use underground. It is built in units of various capacities and any number of sections may be joined together, forming a continuous board.

One of the most frequent causes of accident from electrical apparatus in mines is due to the improper handling of switch gear, in spite of good design. With the class of electrical installation which is usual in collieries, it is by no means an easy matter to be sure that a cable is thoroughly and effectually free from potential. It will be easily seen that where the supply voltage is fairly high,

The switch itself is inclosed in a strong cast-iron case built up in three sections. The middle section supports the whole of the mechanism, and is the portion which travels on steel rollers carried in runways which support the switch and facilitate the movement either inward or outward. The upper section consists of two parts, and is made in two styles. In a simple case, for which no isolating switches are required, this top portion is in one piece, and forms a cover which is bolted to the middle section. In the case of a true mining switch, however, namely, one with isolating plugs interlocked, the upper section consists of two castings, one being a back plate

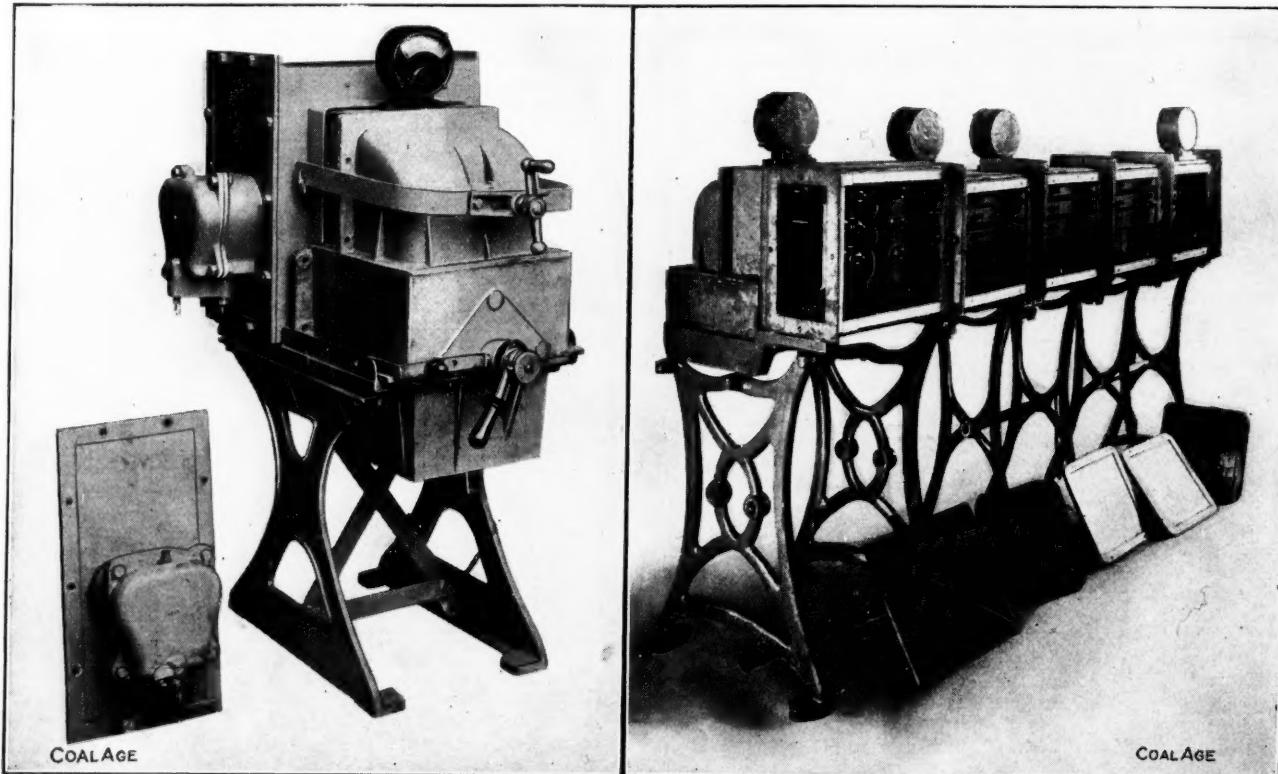


FIG. 1. REAR VIEW OF A SINGLE UNIT

FIG. 2. SEVERAL UNITS JOINED TOGETHER, FORMING A SWITCHBOARD

accidents may easily arise through workmen handling conductors under the impression that they are free from potential, when such is not the case.

Mining work necessarily involves certain special conditions, to meet which great care in design and construction is necessary. In order to meet the special circumstances surrounding underground operations, Messrs. Switchgear & Cowans, Ltd., of Manchester, England, have installed a new type of switch pillar in some important collieries. The chief principles upon which this switch gear is constructed will be noted from the photographic illustration of a single unit, shown in Fig. 1, a switchboard seen from the back, made up of several units, shown in Fig. 2, and a cross-sectional elevation of the typical arrangement illustrated in Fig. 3.

containing the necessary switch plugs, and the other the cover, which is bolted both to the back plate and to the middle section.

The back plate also carries on the side remote from the cover a cast-iron trunk, which slides within a second trunk attached to the busbar chamber. The object of these two trunks, the one sliding within the other, is to protect the plugs during withdrawal. The lower section consists of a tank, which is of cast iron, strengthened by external ribs. The middle, top and lower sections are bolted together through wide machined flanges, fitting sufficiently tight to make them practically dustproof.

It has been found by experiment that the rise in pressure due to an explosion of gas within the cast-iron box is in the neighborhood of 60 to 80 lb. per square inch.

The cases of these mining switches are therefore constructed to safely withstand a pressure of 160 lb. per square inch, giving a sufficient factor of safety.

The joints are, as stated above, machined. This does not mean that they are gastight, but it has again been determined by experiment that the gases from an explosion are sufficiently cooled in passing between flanges of considerable width to prevent the possibility of their firing other gases outside the case. The principle adopted, therefore, is that gases may accumulate within the case, and may be exploded without igniting explosive gases existing in the neighborhood of the switch.

The voltages in use in Great Britain are classified in two main ranges, one up to 500 volts, and the other up to 3000 volts, the lower being termed medium-pressure and the latter high-pressure transmission systems. Above 300 volts potential the manufacturers mentioned prefer to go to the cabinet type of drawout switch, which does not lie within the range of the present article.

Confining ourselves for the moment to the drawout pillars, as shown in the illustrations, the medium-pres-

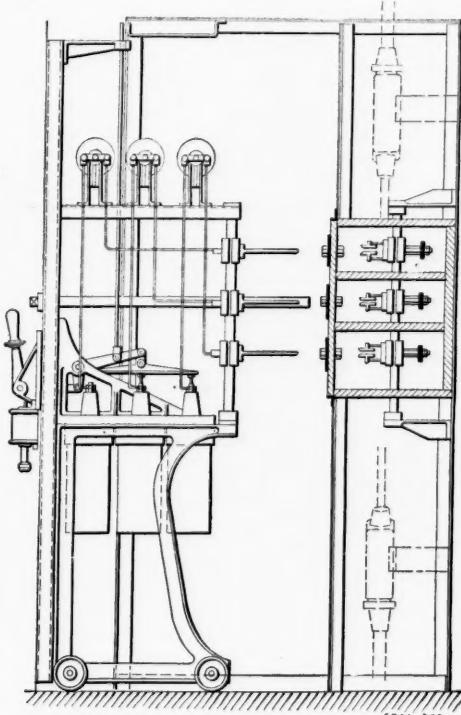


FIG. 3. SIDE ELEVATION OF SWITCH UNIT

sure type is made in three sizes; namely, 100, 300, and 750 amperes capacity, while a smaller size for 70 amperes is now in process of standardization.

Turning to the construction of the switch itself, each has three laminated bow-shaped brushes with an ample head of oil above them. These contacts are controlled by both overload and no-load trips. It is also impossible to forcibly hold the switch in when an overload is passing. An indicator is provided to show the position of the switch independent of the handle, and interlocks are furnished so that it is impossible to push the switch into its socket when closed, and equally impossible to withdraw it from the socket when it is in a similar position.

All the various sizes have been so designed that they bolt up to one another to form a switchboard. The busbars, as will be seen in Fig. 2, are contained in a rectangular case, running behind the plugging gear. Both

inlets and outlets enter the busbar chamber direct, and hence any disconnecting has to be done when the switch is removed for inspection or repair.

It will be seen that the busbars are arranged at the top of the busbar trunk, the bottom half being therefore available for connecting the cables and sockets direct. With a feeder switch, for example, the upper sockets are connected direct to the three busbars and the lower sockets to the three cables. With the switch plug a complete control is exercised both by hand and automatically.

Fig. 2 shows a number of units arranged in the form of a switchboard, the cast-iron legs being so proportioned as to allow of uniform grouping irrespective of the size of individual units of which the group is composed. In such a board a spare busbar section may at any time be included for the purpose of mounting instruments, such as a synchronizer, voltmeters, power-factor indicators, wattmeters, and similar instruments.* The best location for a section of this kind is usually about the middle of the assembled board.

A large number of these switches have been installed in the South Wales coal field, where the conditions of operation are severe. Other localities in England and Scotland have also utilized this switch. It, therefore, forms a useful example of the way in which some of the difficulties attendant upon the electrical operation of collieries have been overcome.

2

Accident Increase in Bituminous Mines of Pennsylvania

The following letter has been sent to all the bituminous mine inspectors in the State of Pennsylvania by the chief of the department of mines:

I beg to submit to you and to all the other inspectors comparative statistics of accidents in the bituminous mines for the years 1912 and 1913. The results in many of the districts are disappointing. The number of inspectors having been increased and the number of mines allotted to several of them having thereby been considerably decreased, it was reasonable to look for a better record for 1913, but instead of that, there has been a large increase in fatalities.

I shall expect an explanation as to the cause for the great increase in accidents from falls, cars and electricity. Some districts show a creditable record, but it is not necessary to name either those whose records are bad or good; the statistics herewith will show each inspector where he stands.

Serious disasters such as the explosion at the Cincinnati mine will occur occasionally, but why the accidents from falls should increase from 249 in 1912 to 313 in 1913, a difference of 25 per cent., and the accidents from electricity from 18 to 23, a difference of 27 per cent., is hard to understand.

I desire in this connection to impress upon you the necessity of keeping constantly on the alert to see that all the mine officials as well as the mine workers observe the provisions of the law relating to safety. Not only must dangers from gas and dust be avoided and guarded against, but the workers must be impressed more forcibly with the necessity for greater care in standing timber and in taking down the roof and coal and in riding on or being about the mine cars, and they must be particularly cautioned to avoid contact with electric wires or other mediums through which fatal shocks may be conveyed. If you can lessen accidents from these causes, much will be accomplished.

It is scarcely possible for many districts to make as good a showing as the 3d, 4th, 8th, 10th, 18th, 27th and 28th districts were fortunate enough to make during 1913, as these, owing to favorable conditions, always make good records; but in the other districts the inside accidents should be greatly reduced. The statement herewith shows that several of the acknowledged dangerous districts had but comparatively few accidents.

Kindly acknowledge receipt of this letter.

Very truly yours,

JAMES E. RODERICK,
Chief of Department of Mines.

ACCIDENTS, BY DISTRICTS, IN THE BITUMINOUS MINES OF PENNSYLVANIA, 1912 AND 1913

First District—A decrease of 50 per cent. in accidents by falls, 33 per cent. by cars and 50 per cent. by electricity.

1912—By falls, 14; by cars, 6; by electricity, 2.

1913—By falls, 7; by cars, 4; by electricity, 1.

Second District—An increase of 33 per cent. in accidents by falls and 25 per cent. by cars. No accidents by electricity.

1912—By falls, 22; by cars, 4; by electricity, 1.

1913—By falls, 28; by cars, 5; by electricity, 0.

Third District—A decrease of 14 per cent. in accidents by falls. No accidents by cars.

1912—By falls, 7; by cars, 3.

1913—By falls, 6; by cars, 0.

Fourth District—An increase of 300 per cent. in accidents by falls.

1912—By falls, 2; by cars, 2.

1913—By falls, 8; by cars, 2.

Fifth District—A decrease of 40 per cent. in accidents by falls and 60 per cent. by cars.

1912—By falls, 10; by cars, 5.

1913—By falls, 6; by cars, 2.

Sixth District—A decrease of 7 per cent. in accidents by falls and 80 per cent. by cars. Two accidents by electricity.

1912—By falls, 14; by cars, 7.

1913—By falls, 13; by cars, 1; by electricity, 2.

Seventh District—An increase of 16 per cent. in accidents by falls and 50 per cent. by electricity.

1912—By falls, 6; by cars, 6; by electricity, 2.

1913—By falls, 7; by cars, 6; by electricity, 3.

Eighth District—A decrease of 25 per cent. in accidents by falls.

1913—By falls, 3; by cars, 0.

1912—By falls, 4; by cars, 0.

Ninth District—A decrease of 10 per cent. in accidents by falls. An increase of 100 per cent. by cars. No accidents by electricity.

1912—By falls, 10; by cars, 3; by electricity, 1.

1913—By falls, 9; by cars, 6; by electricity, 0.

Tenth District—A decrease of 57 per cent. in accidents by falls and 50 per cent. by cars. One accident by electricity.

1912—By falls, 7; by cars, 2; by electricity, 0.

1913—By falls, 3; by cars, 1; by electricity, 1.

Eleventh District—An increase of 33 per cent. in accidents by falls and 150 per cent. by cars. No accidents by electricity.

1912—By falls, 9; by cars, 2; by electricity, 1.

1913—By falls, 12; by cars, 5; by electricity, 0.

Twelfth District—An increase of 44 per cent. in accidents by falls. Two accidents by cars.

1912—By falls, 9; by cars, 0; by electricity, 1.

1913—By falls, 13; by cars, 2; by electricity, 1.

Thirteenth District—An increase of 40 per cent. in accidents by falls. A decrease of 50 per cent. by cars. No accidents by electricity.

1912—By falls, 5; by cars, 6; by electricity, 2.

1913—By falls, 7; by cars, 3; by electricity, 0.

Fourteenth District—An increase of 66 per cent. in accidents by falls and 100 per cent. by cars. One accident by electricity.

1912—By falls, 6; by cars, 3; by electricity, 0.

1913—By falls, 10; by cars, 6; by electricity, 1.

Fifteenth District—An increase of 20 per cent. in accidents by falls and 50 per cent. by cars.

1912—By falls, 10; by cars, 4.

1913—By falls, 12; by cars, 6.

Sixteenth District—An increase of 90 per cent. in accidents by falls. A decrease of 33 per cent. by cars.

1912—By falls, 10; by cars, 12.

1913—By falls, 19; by cars, 8.

Seventeenth District—An increase of 70 per cent. in accidents by falls and 100 per cent. by cars.

1912—By falls, 7; by cars, 2.

1913—By falls, 12; by cars, 4.

Eighteenth District—A decrease of 25 per cent. in accidents by falls. Two accidents by electricity.

1912—By falls, 8; by cars, 0; by electricity, 0.

1913—By falls, 6; by cars, 0; by electricity, 2.

Nineteenth District—A decrease of 28 per cent. in accidents by falls. An increase of 100 per cent. by cars and two accidents by electricity.

1912—By falls, 21; by cars, 3; by electricity, 0.

1913—By falls, 15; by cars, 6; by electricity, 2.

Twentieth District—An increase of 80 per cent. in accidents by falls and 100 per cent. by cars.

1912—By falls, 10; by cars, 2.

1913—By falls, 18; by cars, 4.

Twenty-first District—An increase of 110 per cent. in accidents by falls and 50 per cent. by cars. A decrease of 66 per cent. by electricity.

1912—By falls, 9; by cars, 8; by electricity, 3.

1913—By falls, 19; by cars, 12; by electricity, 1.

Twenty-second District—An increase of 100 per cent. in accidents by falls and 100 per cent. by cars. No accidents by electricity.

1912—By falls, 5; by cars, 1; by electricity, 3.

1913—By falls, 10; by cars, 2; by electricity, 0.

Twenty-third District—An increase in accidents by falls of 14 per cent. A decrease of 44 per cent. by cars. One accident by electricity.

1912—By falls, 7; by cars, 9; by electricity, 0.

1913—By falls, 8; by cars, 5; by electricity, 1.

Twenty-fourth District—An increase of 23 per cent. in accidents by falls. A decrease of 33 per cent. by cars. Three accidents by electricity.

1912—By falls, 13; by cars, 6; by electricity, 0.

1913—By falls, 16; by cars, 4; by electricity, 3.

Twenty-fifth District—An increase of 40 per cent. in accidents by falls and 100 per cent. by electricity.

1912—By falls, 15; by cars, 4; by electricity, 1.

1913—By falls, 21; by cars, 4; by electricity, 2.

Twenty-sixth District—An increase of 44 per cent. in accidents by falls. A decrease of 66 per cent. by cars. An increase of 200 per cent. by electricity.

1912—By falls, 9; by cars, 6; by electricity, 1.

1913—By falls, 13; by cars, 2; by electricity, 3.

Twenty-seventh District—This is a new district. Seven lives were lost by falls and 1 by cars.

Twenty-eighth District—This is a new district. Five lives were lost by falls and 1 by cars.

XX

A New Anthracite Mine Inspectors' Board

The appointment of a new board of mine inspectors' examiners by the court of Luzerne County is thought by mine workers to purpose the end of the alleged system of former boards. It was charged that they passed just enough men to fill the vacancies existing, in order to settle who should fill the positions without the necessity of an election. There have been various candidates for the office of Inspector of Mines in past examinations, but at each election it has developed that there were just the necessary number of eligibles to fill the ballot. The claim was made that this system showed favoritism, and so many complaints were made that the court appointed an entirely new board. This board is composed of George P. Gallagher, of West Pittston, assistant division superintendent for the Lehigh Valley Coal Co.; Charles S. Miles, of Wilkes-Barre, consulting engineer; Benjamin McEnany, of Exeter; Thomas J. Evans, of Nanticoke; and Patrick Dougherty, of Lansford, practical miners.

XX

Decrease in Fatalities in West Virginia

The Department of Mines, of West Virginia, has completed its compilation of the fatality record for 1913. The record shows a decrease of about seven per cent. in spite of an increase of seven per cent. in the number of men employed. The total number of fatal accidents was 335 as against 359 in 1912, a decrease of 24. The miners employed now number 73,251 as against 68,248 in 1912, an increase of 5,273.

The months of March and August lead in the death list with 34 each, while April, with 22, makes the best showing. The monthly record is:

FATALITIES BY MONTHS IN WEST VIRGINIA 1913

| | | | |
|---------------|----|----------------|----|
| January..... | 29 | July..... | 28 |
| February..... | 33 | August..... | 34 |
| March..... | 34 | September..... | 26 |
| April..... | 22 | October..... | 25 |
| May..... | 28 | November..... | 26 |
| June..... | 24 | December..... | 26 |

It is interesting to note that 109 of the 335 fatalities, or almost one-third, were due to the carelessness of the

victims, themselves, and should have been avoided. If they had not occurred, the fatality count would have been 226, the lowest since 1905, when it was 212.

A recapitulation of the fatalities, when classified as to causes, shows that 204 of the 335 were due to falls of roof and coal; 87 were the result of transportation mishaps; only 8 were caused by explosions, this number being a new record for the state; 8 were due to machinery; 16 to electrocutions, and 12 had miscellaneous causes, such as falling down shafts, kicks by mules and the like.

The death rate for each thousand men, employed in 1913, was 4.55, a decrease of 0.61 from 1912, when it was 5.26. This is the best rate since 1905. The rate from 1905 to 1913, inclusive, follows:

| MINING DEATH RATE IN WEST VIRGINIA, 1905-1913 | | | |
|---|-------|-----------|------|
| 1905..... | 4.38 | 1910..... | 4.79 |
| 1906..... | 5.44 | 1911..... | 5.24 |
| 1907..... | 12.43 | 1912..... | 5.26 |
| 1908..... | 5.43 | 1913..... | 4.55 |
| 1909..... | 6.06 | | |

■

The Koehler Safety Lamp

This lamp is designed after the pattern of the well known Wolf lamp, the patents of which have expired. The design of the lamp is a general improvement on the former type. It is claimed that nothing short of deliberate carelessness on the part of the lampman or the user of the lamp can make the same unsafe.

One of its chief features is the simplicity of its construction, embodying also the features of strength durability and security. The lamp consists of but 12 parts, counting all the separate pieces of the lamp, chimney and igniter. These parts are well fitted together, and the general workmanship of the lamp is as nearly perfect as it is possible to make it.

The lamp is designed to burn naphtha, which is absorbed and held in the cotton, within the oil vessel of the lamp. The oil vessel is of compressed steel, with a brass top, securely brazed thereto. The chimney consists of a $2\frac{1}{4} \times 2\frac{1}{4}$ -in. Macbeth glass, surmounted by a double-gauze chimney, provided with a steel spring washer to hold the gauzes tight against the glass. In the upper portion of the chimney, the gauzes are further protected by a pressed-steel bonnet, which is secured to the lamp ring below the glass by five brass standards. The lamp vessel is secured in the lamp ring by a screw-plug lock or an electric magnetic lock, as desired. Also, when desired,



THE KOEHLER NAPHTHA
SAFETY LAMP

the steel bonnet of the lamp is omitted. The lamp complete weighs 2 lb. 15 oz. to 3 lb. 4 oz., according to its fittings. The height of the lamp is 10 in.

The Koehler lamp is manufactured by the Koehler Manufacturing Co., Marlboro, Mass., at a price less than that previously paid for lamps of a similar type. The lamp has already been adopted by 48 companies and is designed for use as a lamp for general mine work, as well as a lamp for testing for gas. There are different models or styles adapted to these different uses. Model No. 7, with a $3\frac{1}{4}$ -in. glass, has a height of 12 in., and is adapted for use in ship holds, coal bunkers, oil refineries, and as a lamp for night watchmen in factories and mills. The "pyro" igniter, used in this lamp is one of the best designs. The cartridge is easily replaceable and throws a spark horizontally that never fails to ignite the wick. The lamp gives a steady light of 1.6 cp. for 18 hr., which, it is claimed, is 70 per cent. greater than that of any other safety lamp of a similar type.

The Koehler Manufacturing Co. also supply electromagnets for opening the Koehler and the Wolf lamps, lamp-filling apparatus, lamp-cleaning machines and complete outfits for lamp cabins; and carry, besides, a large stock of safety-lamp glasses for all types of lamps.



THE KOEHLER
PYRO IGNITER

Pennsylvania Mine Foremen's Examinations

At a conference of nine anthracite-mine inspectors, with superintendents and expert miners, 32 in all, representing the collieries and washeries in Schuylkill, Carbon, Dauphin, Northumberland and Columbia Counties, held at Pottsville, it was decided to hold the annual examination for eligibility as mine foreman and assistant mine foreman, at Pottsville, on April 3. It is expected that there will be about 200 applicants to take the examinations.

■

BY THE WAY

A mine mule don't kick accordin' to no rule.

■

It takes a heap of licks to drive a nail in the dark.

■

Nothing is so new as what has long been forgotten.

■

No man should think to cast a shadow like an elephant.

■

It frequently happens that one murder makes a villain, millions a hero.

■

You may be a hammer today, but perhaps tomorrow, you may be the anvil.

■

It is not easy to straighten in the oak the crook that grew in the sapling.

The Vancouver Island Strike Anomaly

SPECIAL CORRESPONDENCE

SYNOPSIS—Brief early history of alleged causes leading to a strike. Method used to force nonunion men into the Union. Recognition of the Union, the real object of forcing the strike upon the men.

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The United Mine Workers of America claim to have paid, to this date, over \$700,000 in relief money to the striking miners on Vancouver Island. If this amount were multiplied by ten it would, approximately, represent the loss inflicted upon the island by the payment of this amount of relief money. The United Mine Workers may boast of having expended this sum of \$700,000, but their boasting only means that the island community has probably suffered a loss of seven millions.

EARLY HISTORY OF THE STRIKE

The strike on Vancouver Island began at the mines of the Canadian collieries, Ltd., located at Cumberland and Extension, September, 1912. Six months later it was extended to the mines of the Western Fuel Co., at Nanaimo, and those of the Pacific Coast Coal Co., at South Wellington. So far as the United Mine Workers are concerned the strike at these places still continues. During the whole of these sixteen months payrolls have either been stopped or very considerably diminished, while general trade and all the manifold businesses connected with the coal industry have been seriously affected. In Nanaimo alone, for the eight months and a half the strike has continued, the Western Fuel Co. would have paid out in wages only, approximately, \$1,500,000.

The only cause of all this trouble, financial loss and the crippling of the island's coal trade at a time when it was enjoying an era of unprecedent activity, is the attempt of the United Mine Workers of America to force itself upon the operators on the island. Other causes for the strike have been alleged by the Union bosses, but they are mere pretexts used to conceal from the men the real object of the strike. Had it been understood by the miners, at the beginning, that they were striking for the recognition of the United Mine Workers of America, in the island, there never would have been a strike. For months and months paid emissaries of the organization had worked the various camps on the island without success. They picked up a few adherents in each of the camps but that was all and these were a negligible minority.

METHODS EMPLOYED TO ENLIST MEN

One of the reasons given by the leaders of the strike was that discrimination had been made against some of the union men and one, a man named Mottishaw, employed by the Canadian Collieries, Ltd., at Cumberland, it was claimed, had been discharged or refused further work when his place was finished, owing to his affiliations. The majority of mine employees, of course, knew nothing of the true particulars. The discharged man while an employee of the same company at Extension mine had served as a member of a gas committee and the officers of the United Mine Workers declared he had been dis-

charged for reporting dangerous conditions in the Extension mine, as he was compelled to do by the Mine Regulation Act, while serving as a member of a gas committee. Reference was even made to the explosion at Extension, in 1909, before the present company took over the property.

As a result of these extraordinary efforts and pretexts, however, the paid officers of the Mine Workers failed to get a strike vote, at a mass meeting held Sunday morning, Sept. 15, 1912, and another meeting was called, for the same evening, which was attended by about one hundred and twenty-five men. To get over the general objection to a strike it was decided to take a holiday the following day, Monday. Pickets were sent out to stop all men from going to work. The management refused to meet a Mine Workers' committee, and the holiday became a strike. Like action was taken at Ladysmith, two days later and all the mines of the company were thus closed down.

This account of the origin of the strike is still being used by the Union bosses to enlist public sympathy. It was magnified into a charge of criminal discrimination by the company, and of criminal negligence by the provincial government in not enforcing the Coal Mines Regulation Act. These charges are absolutely without foundation. The discharged man Mottishaw was connected with only one gas committee and signed only one report in which there is no hint of dangerous conditions existing in the mine. All the reports, both of mine inspectors and gas committees, are on file in the Provincial Mine Department, and neither in June nor July, 1912, do they contain a hint of dangerous conditions. In fact, the June report, on account of which the man Mottishaw is alleged to have been discharged, states positively that the mine was in a "fair condition."

THE "GAS COMMITTEE" ARGUMENT

These facts altogether dispose of the allegations that Mottishaw was discriminated against by the company for reporting the Extension mine unsafe, after an examination of the workings as a member of the gas committee. If other evidence were needed there is a statement of Frank Farrington, in a letter to the Hon. T. W. Crothers, Minister of Labor, Dec. 15, 1913, which states, "the mines were as safe as human hands could make them," and adds, "With experienced miners employed, the mines are still as safe as ever." The fact remains that the strike was undertaken solely to force men into the Union, and to enable the Mine Workers to demand recognition from the operators.

Relief money was paid to all men alike, whether or not they belonged to the Union; but the average man did not like the idea of drawing relief money without enrolling as a member of the Union; and, the more relief money a man drew, the greater he felt his obligation to the Union, and, consequently, the more reluctant he was to return to work. In this way, hundreds of men who had no sympathy with the strike, and strongly objected to the manner in which it was brought about, were yet bound to the Union.

The operation of this principle can be seen more plainly in what happened at Nanaimo and South Wellington. As soon as the Canadian Collieries Company realized the issue that had been forced upon it, it took steps to reopen the mines. In six months' time, the mines at Cumberland were almost back to their normal output, and over three hundred men were again working at Extension. The union bosses realized that they were facing defeat, and saw nothing for it but to get the men out at Nanaimo and South Wellington. They had tried already to do this by every artifice in their power; but, at these collieries, there were living agreements between the men and the operators and there was no complaint, either as to wages or working conditions. They could not break into the men, who even remained indifferent to the taunt that they were indirectly "scabbing" against their fellow-workers at Cumberland and Extension. As a matter of fact, the Union organizers had been able to make no headway at Nanaimo, and out of a camp of 1500 men there were not 200 members of the Mine Workers. A big coup was necessary.

THE CALL FOR A STRIKE ISSUED

The first day of May was to be observed as a labor holiday, in and around Nanaimo. Seeing that there had been a strike at Ladysmith for six months, it was arranged to hold a big demonstration there on the holiday. On the 30th of April, Frank Farrington, the chief officer of the Mine Workers, on the Pacific Coast, issued a strike call from Seattle. It was addressed to R. Foster, the local president of the U. M. W. of A., and instructed him to "call a strike of all the men employed in and around the mines at Nanaimo, South Wellington and Jingle Pot; the strike to begin May 1, and to continue until a joint working agreement between the United Mine Workers of District 28, and the mine owners on Vancouver Island was secured." It will be noted that the object of the strike is here definitely stated as recognition of the Mine Workers, and it should be borne in mind that at that time there were not 15 per cent. of the miners of Nanaimo members of the organization.

The first feeling among the miners, as well as the general public, was to regard the strike decree as a joke. This feeling soon changed to anger and consternation. The union organizers made the most of their opportunity with the men attending the demonstration at Ladysmith. They had also arranged for a mass meeting, at Nanaimo the same night, at which meeting all opposition was ruthlessly silenced. Those of the men who advocated living up to their agreements with the operators were shouted down, while others who asked for a ballot were told there was no need for one. Ervine, one of the leading organizers, declared that the man who went to work would be a "scab." In view of these circumstances, the men opposed to the strike called a meeting for the next night, but it was broken up by rowdyism. They then decided to make one more effort to secure a ballot; but, while they went through with their proposal, it was rendered nugatory by the strike-makers. President Foster got out a dodger, which was circulated and posted all over town, in which it was declared that "a strike had been called and ballot or no ballot, any man who went to work would be branded as a "scab." In the face of this intimidation, and the presence of a large and threatening crowd around the ballot station, less than five hundred

votes were cast on the question of striking. Of this number, less than forty voted to strike. It was by these methods that the strike was made general on the island; and, as at Cumberland, the men opposed to the strike felt obliged to join the union.

NOT A FREE BALLOT

It will be noticed that, in neither case was a free ballot taken. It must also be recorded that during all the time the strike has lasted, a period of 16 months, such a ballot has never been taken. It will again be observed that, on the basis of membership, the officers of the Mine Workers had neither right nor justification in calling a strike. It must also be concluded that even after the majority of the men joined the organization, its officers have always been afraid to refer the issue to a ballot. The Western Fuel Co. has made three separate overtures for a settlement. On one occasion it offered to meet a committee composed of seven of its employees, to be elected at a mass meeting, to discuss and arrange an agreement. This agreement would again be referred to the men for ratification by secret ballot. The committee thus elected, if agreeable to the men, could act as a standing committee, for a period of time to be agreed upon, for the purpose of taking up any grievances that might arise in the daily operation of the mine; and the company would meet the committee, at least once a month or oftener if required, and also pay the wages of the men while attending these meetings. The offer was turned down without reference to the men; and thus it happens that, while in the beginning the miners were ordered out on strike without a vote, so in the end they are committed to a game of "freeze-out" without a vote.

It is also true that the men who have thus been jockeyed out of their employment enjoyed unusually favorable conditions of work. It is important that the miners in the States who have contributed over seven hundred thousand dollars to the support of the miners on the Island of Vancouver should know and realize this fact. The province has one of the most complete and up-to-date Mines Regulation Acts in the world.

All the mines are equipped with a Draeger Rescue station, and all the mine workings must be examined by provincial mine inspectors at least once a month. There must also be a monthly inspection by a gas committee appointed by and representing the men. The working day is fixed by statute, as eight hours from bank to bank. As for wages, the average wage for the year preceding the strike, in the mines of the Western Fuel Co., was \$4.86 a day for contract diggers and \$3.20 a day for company miners. For April, the last month the mine worked before the strike, the average daily wage of diggers was \$5.11 and of loaders, also on contract, \$4.34.

Taking conditions right through, it is extremely doubtful if there is a colliery on the American continent that will compare with the Nanaimo mines of the Western Fuel Co. and the situation today is that every mine on the island is operating. Over five hundred men have returned to work in Nanaimo, and as fast as places can be made ready, men are offering themselves. The strike is hopelessly beaten, but at an immense cost to the coal operators, miners, and the general community of the Island, as well as to the miners of the States who have been mulcted in behalf of men enjoying better conditions than themselves.

How an Explosion Is Modified by Obstructions

SYNOPSIS—*An explosion is created in a gallery which is obstructed, more rapidly than in one which is clear but we must not assume that the presence of these obstructions makes any difference to the ultimate force of an explosion. In a short gallery the effect of an inflammation of coal dust does not have time to reach its maximum unless constrictions are provided to create favoring conditions.*

Many experiments, of which that described (No. 119) in a previous article is an example, were made with the gallery perfectly clear, so that the inflammation was free to travel from one end to the other without encountering any obstruction which might cause irregularity in its development.

Previous to the commencement of a systematic study of the manner of development of the explosions, however, the gallery had been used for demonstrating the fact that coal dust was capable of forming an explosive mixture with air. In these demonstrations, the inside of the gallery was furnished with props and timber set to represent the manner in which the roof of the roads in coal mines is supported.

The timbering consisted of pairs of wooden props, 6 in. in diameter, fixed on either side of the gallery with a tightly-wedged bar at the top holding them in position. These pairs of props with bars were fixed every 9 ft. throughout the gallery; the force of the explosion usually dislodged all of them, projecting some of them 300 or 400 ft. out of the open end of the tube and giving an effective proof of the power of an explosion of coal dust and air to do damage. See "Record" of the Mining Association, p. 91, and following pages.

OBSTRUCTIONS INCREASE SIDE PRESSURES

The pressures recorded during these demonstrations sometimes amounted to as much as 50 lb. per square inch for a distance of travel of the explosion of only 225 ft. In contrast to this, it has already been shown that when the gallery was clear a pressure of only 16 lb. per square inch was developed after a distance of travel of 450 ft.

Several series of experiments were therefore made with a view to determining the influence of constrictions in the gallery on the propagating of an inflammation. These experiments bring out very clearly the salient difference between "inflammation" and "explosive combustion," and show that the change from the one type of propagation to the other is susceptible of control.

Inasmuch as a large number of constrictions, such as were represented by the props and bars in the demonstrations, so complicated the phenomena as to render the pressure-curves obtained hardly intelligible, the effect was tried of introducing one constriction at a time.

Note—Third part of the fourth report of the British Explosions in Mines Committee. The two previous parts are "Concussion as a Cause of Explosions," Jan. 3, 1914, Vol. 5, pp. 19-21, and "The Transition from Inflammation to Explosion of Coal Dust," Jan. 31, 1914, Vol. 5, pp. 207-210.

CONSTRICION ONLY A 6-IN. RING

The constriction was obtained by bolting on to the inside of the gallery an angle-iron ring having a 6-in. flange which reduced the diameter of the gallery at the point where the ring was fixed from 7 ft. 6 in. to 6 ft. 6 in., the amount of surface exposed at right angles to the direction of movement of the explosion being 11 square feet.

In the series of experiments to be described, the point of ignition was 400 ft. from the open end. The method of performing the experiments was in each case exactly the same as in experiment No. 119, of which details have been given.

EXPLOSION PRODUCED 2 LB. PRESSURE IN A SMOOTH-SIDED GALLERY

The first experiment of the series (No. 123, June 22, 1910) was made with the gallery clear of all constrictions. A slowly-moving inflammation was all that was produced. The pressure-curve traced by the manometer most distant from the point of ignition, 350 ft. (No. 6, Fig. 1), showed a maximum pressure of only 2 lb. per square inch, and that pressure was attained but slowly. Moreover, the curve shows no sign of any sudden rise of pressure such as accompanies "explosive combustion."

The effect of introducing a single constriction at a point 200 ft. from the point of ignition (experiment No. 142, Aug. 26, 1910), was to raise the maximum pressure produced to 105 lb. per square inch for the same distance of travel. This maximum pressure was attained about one second after ignition, as against 1½ sec. required when no constriction was present. The pressure curves, which are described later, indicated the beginning of "explosive combustion" at a point about 350 ft. from the point of ignition.

PRESSURE RISES FASTER, THE ROUGHER THE GALLERY LINING

A single, constriction, therefore, shortens in a remarkable degree the distance that has to be traveled before "explosive combustion" begins.

A second similar constriction was now introduced at a point 250 ft. distant from the point of ignition, (experiment No. 144, Aug. 30, 1910). The maximum pressure, which was attained about three-quarters of a second after ignition, now reached 21 lb. per square inch, and the curves traced by the manometers both at 350 and 300 ft. from the point of ignition, showed the abrupt increase in pressure that we regard as indicative of explosive combustion.

When a third constriction was made, at a point 300 ft. from the point of ignition, (experiment No. 139, Aug. 23, 1910), the maximum pressure produced was 55 lb. per square inch, attained about two-thirds of a second after ignition.

In order to bring out the important features of these experiments, it is not necessary to reproduce all, or the whole of any one, of the pressure-curves traced during each experiment. We have already shown that for a considerable period after the time of ignition, the pressure-

curve traced, is merely that due to the igniting-cannon and is of no particular interest from the point of view of the development of coal-dust explosions.

To avoid confusing diagrams, therefore, those portions of the curves that were due to the igniter pressure are omitted in Fig. 1. Further, although in each experiment records were obtained of six manometers (fixed 100, 150, 200, 250, 300 and 350 ft., respectively, from the point of ignition), the curves of chief interest are, as can readily be understood, those traced at the points most distant from the point of ignition, after explosive combustion had been attained. Therefore, these curves only, are reproduced.

EXPLANATION OF DIAGRAMS

Examination of these curves show the effect of constrictions very clearly. The curve at the top, Fig. 1, shows the pressure recorded at the manometer most distant from the point of ignition—350 ft.—when the gallery was clear of all obstructions. It is obvious that the result was merely a slow inflammation.

The diagram below this curve reproduces two curves traced during experiment No. 142, in which one angle-

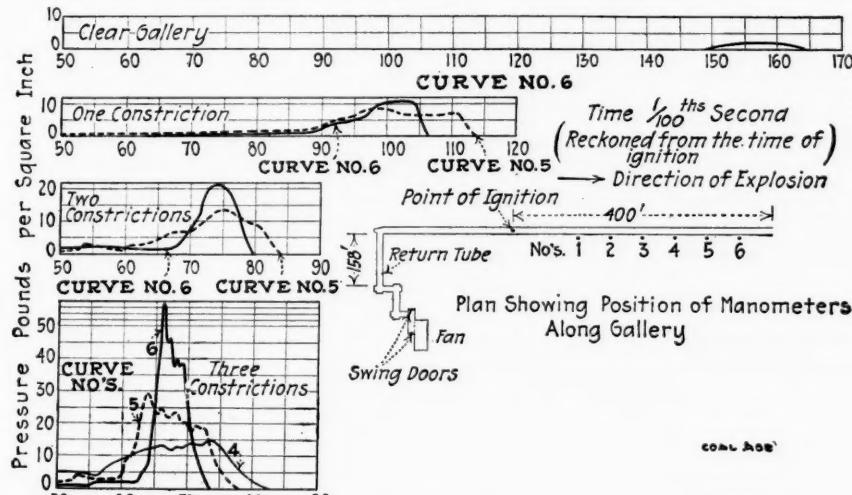


FIG. 1. PRESSURE CURVES RESULTING FROM INSERTION OF CONSTRICTING OBSTRUCTIONS IN EXPLOSION GALLERY AS MEASURED BY MANOMETERS 4, 5 AND 6

iron constriction was fixed at a point 200 ft. distant from the point of ignition. No. 5 curve is that obtained at a point 300 ft. from the point of ignition and No. 6 that at 350 ft. distance; this latter curve, therefore, corresponds with No. 6 curve in experiment No. 123, when the gallery was clear. It will be seen that there are distinct signs in No. 6 curve of experiment No. 142, of the sudden rise of pressure, indicative of the beginning of "explosive combustion"; this occurs after an interval of 97 hundredths of a second from the time of ignition.

The next two curves, No. 5 and 6, of experiment No. 144, show the result of introducing a second constriction at a point 50 ft. distant from the first. In this case, there are indications of the beginning of "explosive combustion" in curve No. 5, at a distance of only 300 ft. from the point of ignition.

Lastly, the two curves, No. 5 and 6, of experiment No. 139, (in which three constrictions had been introduced) both show the sudden rise of pressure, due to "explosive combustion" which has apparently begun to be developed

(as shown by curve No. 4) within 250 ft. of distance from the point of ignition.

Summarising: The influence of constrictions on the development of the explosion as shown by this series of experiments, was as follows:

| Number of Constrictions | Maximum Pressure Developed, Lb. per Sq.In. | Interval of time Between Ignition and Attainment of Maximum Pressure, Hundredths of a Second |
|--|--|--|
| None | 2.0 | 155 |
| One, 200 feet from the point of ignition | 10.5 | 103 |
| Two, 200 and 250 feet from the point of ignition | 21.5 | 74 |
| Three, 200, 250, and 300 feet from the point of ignition | 57.0 | 66 |

The most striking comparison is perhaps obtained from experiment No. 119, already described, and No. 137

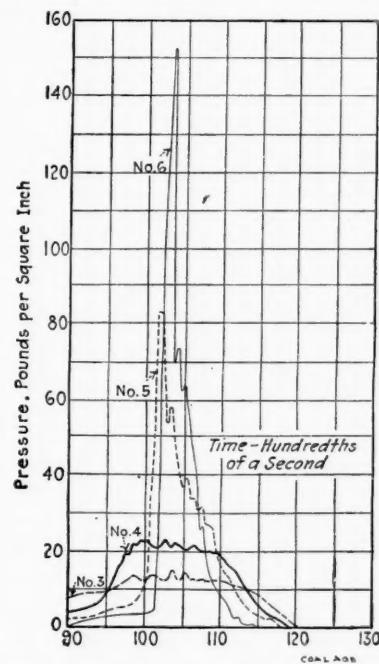


FIG. 2. THE HIGH PRESSURES IN THIS FIGURE, SHOWING EXPERIMENT NO. 137, EXHIBIT EFFECT OF CONSTRICTIONS IN PATH OF EXPLOSION

July 28, 1910). In the former, it will be remembered, the point of ignition was 500 ft. from the open end of the gallery, and the gallery contained no constrictions. In the latter, three constrictions were introduced at points 300, 350 and 400 ft. from the point of ignition. Except for the presence of these constrictions, the experimental conditions in experiment No. 137, were the same as in No. 119.

The pressures recorded by the manometers along the gallery were as follows:

| Distance of Manometer from Point of Ignition, Ft. | Experiment No. 119 (Clear Gallery) Pressure Lb. per Sq.In. | Experiment No. 137 (Three Constrictions) Pressure Lb. per Sq.In. |
|---|--|--|
| 300 | 4.5 | 23.0 |
| 400 | 6.5 | 83.0 |
| 450 | 16.0 | 152.0 |

ASSUMPTION THAT CONSTRICTIONS INCREASE ULTIMATE VIOLENCE IS NOT WARRANTED

The essential parts of the four curves recorded by the manometers most distant from the point of ignition, in experiment No. 137, are reproduced in Fig. 2. If these

curves are compared with the corresponding curves of experiment No. 119, which are reproduced in the previous article, the remarkable effect produced by offering a slight obstruction to the passage of the explosion at, but three points along its path, 50 ft. apart, will be appreciated. We do not propose at this stage to discuss the theory of constrictions in augmenting the intensity of explosions of gas and coal dusts; but we would point out that the effect of such constrictions in the gallery and,

presumably, of obstructions in the roadway of a mine is not necessarily to increase the *ultimate* violence of which a coal-dust explosion is capable, but to enable it to obtain violent proportions at a much earlier period than in a smooth gallery.

Experiments which are now being carried out at Eskmeals illustrate and confirm many of the experimental conclusions above set forth. We hope shortly to give an account of them.

* * *

The Price War in the Markets of the Pacific

BY W. A. MACCORKLE*

SYNOPSIS—The Panama Canal does not furnish the shortest route from Europe to Asia and Australia but may supply the most economical, in view of the relative cheapness of good coal along the way. Coal is carried for less than cost by ship owners who are seeking ballast for their empty bottoms but this practice is declining. The author expects the coal of West Virginia to dominate at least at the Panama Canal and along the nearer coast of the Pacific.

*

The Suez and Panama Canal routes, respectively, control the great international trade lines of the world. Which of the rival routes will receive the bulk of the traffic will not be decided solely by the relative distances of travel, which using one or the other will entail. After a somewhat careful investigation of these great trade routes, it seems that the shipowner will use one route or the other, actuated not only by mere distance but also by the price and quality of the fuel he can purchase along the line.

PANAMA, THE GREATEST COAL-DISTRIBUTING POINT IN THE WORLD

If the route through the Panama Canal becomes that most generally used by the ocean-going ships of the world, the isthmus will in itself become the greatest coal-distributing point upon which the sun shines and this fact will make the fuel of West Virginia one of the preponderating influences in the world of trade.

The great markets of the North Atlantic, from which come the life of commerce, are already taken and firmly held. Today, the great market for competition is the mighty Pacific and upon the shores encircling its bosom are the unoccupied markets for which the world will join in deadly competition. Its shores are the longest, its seas are the quietest, its populations are the most teeming and many of the essentials of life are the products of the lands encircling this great ocean.

Gold, silver, precious stones, splendid woods, dyes, rubber, silks and all things necessary to life are here produced. Nations, yellow, brown and white, filled with the desires of new commerce, fired with new hope by the touch of the West, thrilled with new ideas of government

and religion, are all mingled in one tremendous combat for the mightiest markets vouchsafed to man since the stars sang together. If the nations of the world approach this empire of commerce through our canal, it means millions of tons of production for West Virginia, and a gold stream pouring in our beautiful valleys and amidst our people, which will be as unending as time.

The eternity of this possession is appreciated when we understand that of the 150 billions of West Virginia workable coal, only two billions have been mined, leaving within our state 148 billions yet untouched. It is generally understood that the canal shortens the distance between Europe and the East, and places the advantage of the distance with us. But let us look at the plain facts.

PANAMA CANAL ROUTE NOT AS SHORT AS THE SUEZ BETWEEN EUROPE AND EASTERN ASIA

All of Asia and Australia and the East generally are nearer Europe by the Suez Canal than by the Panama route. This is not popularly understood. The distance from Liverpool to Adelaide by the Suez route is 11,142 miles. Via the Panama route, the journey is 13,478 miles, the Suez Canal being the shorter by 2336 miles. To Manila from Liverpool via the Suez Canal, the distance is 9701 miles, by the Panama route 14,122 miles. Thus the Suez route is 4421 miles shorter than the other. To Hong Kong from Liverpool by the Suez Canal is 9785 miles, by the Panama Canal 13,957 miles. Thus the Suez Canal has an advantage of 4172 miles. To Yokohama from Liverpool by the Suez Canal is 11,678 miles, and by the Panama Canal 12,372 miles. Here, also, the Suez Canal is the shorter, this time by 694 miles. I give these distances at length to show that it will be cheap fuel and not distance which will largely control the great bunker trade of the world, if Europe uses the Panama rather than the Suez Canal.

THE UNITED STATES COAL TO DOMINATE PACIFIC

The use of the Panama Canal will give New York 4138 miles advantage over Liverpool on the journey to Wellington, New Zealand, and the distances will be about equalized, relatively speaking, on the journey from New York and Liverpool to the countries I have mentioned.

The canal should allow this country largely to dominate by distance the coast of South and Central America.

One enormous advantage today, possessed by the Suez Canal, is the fact that coaling stations are located along

*Ex-governor of West Virginia, Charleston, W. Va.

Note—Abstract of first part of an address entitled "The Relation of West Virginia Coals to the Panama Canal" read before the West Virginia Coal Mining Institute, Charleston, W. Va., Dec. 8, 1913. The author acknowledges the assistance of Neil Robinson, president of the association in furnishing material for the address.

the great English trade routes, so as to give the greatest accommodation to the trade of the world. If this country proposes to take any part of the steaming demand of the world from the English nation, it must provide ample coaling stations for international commerce.

It is the province of the government of the United States to provide at the Panama Canal a great coaling station where the ships of the world may obtain their fuel at a cost affording a fair profit to the producer and to the shipowner. This is now being done, and at both ends of the canal our government is constructing the most modern coaling stations ever used in the trade.

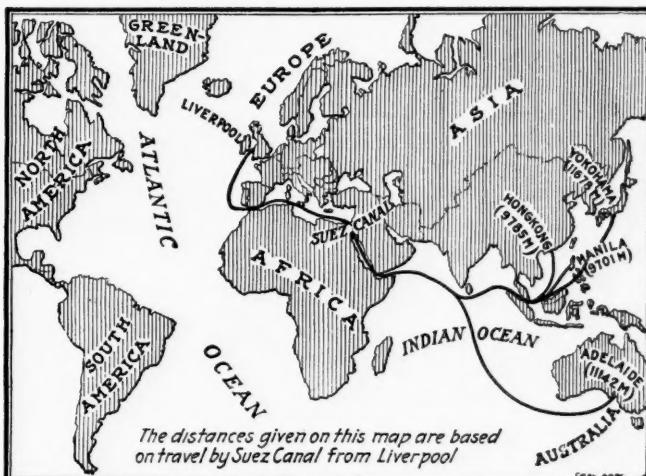
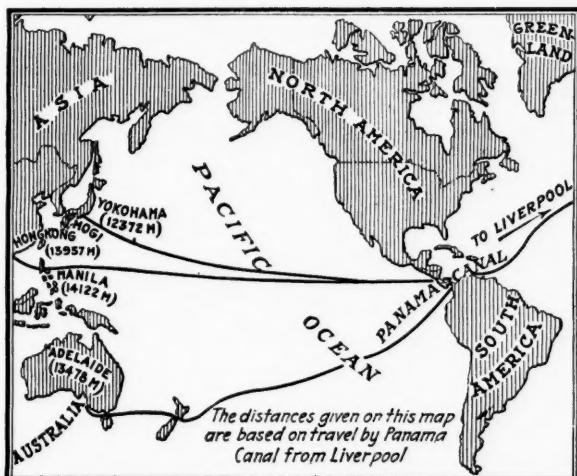
NEED FOR AN AMERICAN MARINE

If these markets become as important in American commerce as they should be, America must control the ships necessary for her trade. Let me illustrate my argument by showing that length of voyage and cheapness of fuel do not always settle the cost of transportation. The marvelous ability of the Englishman to ship his coal to every part of the world and sail his ship in every sea, despite the competition of the nations, is well exemplified

was determined to be better for all purposes at the Isthmus than any other coal. This conclusion was reached after the Government had considered all the coals in the market. It is paying \$2.70 at Norfolk for this coal and \$1.29 for its transportation to the Isthmus. The contract provides that if the commercial price of coal declines, the contract price is to be reduced to \$2.65 per ton. If this price prevails the cost of coal at Colon will be \$4.09½. With all the lighterage, depreciation and overhead charges added, West Virginia coal will cost \$5.09½ at Panama, or if the price at Norfolk should be reduced during the contract it will be \$5.04½. It will also be possible for coal to be sold by the canal authorities at \$5.54½ on the Pacific side of the Canal.

WELSH COAL AT PORT SAID COSTS \$6.33 PER TON

In 1912, the contract price of Welsh coal at Port Said was \$6.33 per ton, and it seems beyond question that coal can be profitably sold by our government at Cristobal for \$1.20 to \$1.25 less than the prices charged at Port Said. The cost of Welsh coal is necessarily increasing year by year.



MAPS ILLUSTRATING THE RELATIVE DISTANCES FROM EUROPE TO PACIFIC PORTS

on the coast of South America. At Valparaiso, Iquique, Antofagasta and other points on the western coast of South America, the coal is largely Welsh and Australian, because of the low freight rates on vessels bound for Chili to secure nitrates. On the eastern coast of South America the same condition exists; British ships control the markets and are able to take coal cheaply to different coasts, as they can obtain the return traffic.

In other words, American coals cannot obtain the markets to which they are entitled, unless American ships are more plentiful upon the seas and American trade is more diversified under new laws and new conditions. Only then may we send our products into every country and among every people.

COST OF COAL AT PANAMA, \$5.09

To test the accuracy of the statement as to the possibility of coal being sufficiently cheap at the Panama Canal to affect the route taken by the world's trade, let us consider the facts as they stand today.

The prices now paid by the Government at Panama have been fixed for two and one-half years, and the coal which is used there comes from West Virginia, which

In a careful calculation made by the Government, a ship of 4640 tons, gross register, operated at a speed of ten and a quarter knots on a round trip made in 1911, between New York and Manila, by way of the Suez Canal, consumed 4475 tons of coal, at a cost of \$20,868.75.

Careful calculation made by this Government upon the prevailing prices for the same ship, leaving New York, coaling at Newport News, Colon, San Francisco and the Japanese ports and back again, coaling at Mogi, San Francisco and Colon, would only use \$18,222.50 worth of coal for the whole trip, the cost of fuel being in favor of Panama by \$2,646.25. Upon the prevailing prices for 1912, the same ship making the same voyage by the Panama route would expend for coal \$18,567, but by the Suez route it would be \$22,608.75, or a difference in favor of the Panama route of \$4,041.75.

In other words, it is fairly established in the trade of the world that prices for coal will be less by the Panama Canal than by the Suez route. If this is so it seems as if the Panama route while longer often times than the Suez route, will be largely used for the reason that the price of coal will lessen the cost of the voyage.

Discussion on Mixed Lights in Mining

SYNOPSIS—The meaning of the expression "mixed lights" explained. An illustration showing the danger of such practice in respect to a possible fall of roof in the gaseous section of the mine. Danger due to careless neglect of rules and regulations—an incident. Igniting the gas for sport, a fool trick. Practice in the Pennsylvania anthracite mines. Illinois conditions and practice. Rule adopted in the T. C. I. mines in Alabama. Ordered the use of safety lamps in mine drawing pillars, in Illinois. Practice in New Mexico mines. Experience in gassy mines in Pennsylvania.

President Adams, in opening the session, announced that he believed Mr. Beard was greatly interested in the question of the use of mixed lights and he would ask him to kindly start the discussion of the evening.

MR. BEARD (New York)—We understand by the expression "mixed lights" in gaseous mines the use of both open lights and safety lamps, in any portion of a mine where certain sections of that same mine are required to be operated by safety lamps only. I believe there are many gentlemen here who are better able to discuss this question than I am, for the reason that they have had much practical experience along these lines. I will give you a few illustrations that certainly convince me that the use of mixed lights is an unsafe practice.

DANGER FROM HEAVY ROOF FALLS

Suppose, for example, we are operating a large mine one section of which is gaseous and the rest of the mine is known to be free from gas. We install a lighting station at the entrance to the gaseous section, assuming that that makes a satisfactory and safe arrangement. There is a man put in charge of the lamp station and no one is permitted to enter that section of the mine without a safety lamp. The other section is worked on open lamps. Under the general mining practice, that has been and is still considered safe. Suppose now a heavy fall of roof occurs in the gaseous section, what is to prevent the gas from being driven out in large quantities from some of the abandoned portions in that section into the places where open lights are used and a serious explosion taking place? That is one instance that, to my mind, condemns the use of open lamps and safety lamps in the same mine.

CARELESS NEGLECT OF RULES AND REGULATIONS

Again, when open lights are allowed in many gaseous mines, safety lamps are only used at the working face. I have known a number of cases where we were required to leave our torches and take a safety lamp when entering a chamber or approaching the working face. Under those conditions you know that many miners will take their open lights up to the face unless they are closely watched; and as is frequently the case, in these workings, the open lights will be used when the boss is not around. If they are caught the boss would, of course, tell them not to do that again and threaten them; but he probably would not

Note—From the published Proceedings of the sixth annual meeting of the Mine Inspector's Institute, U. S. A., held at Birmingham, Ala., June 10-13, 1913.

discharge a man, because good miners are hard to get. A foreman, if asked, will give the excuse for not calling down any violation, that he cannot afford to discharge a good man for a little matter like that.

I remember a few years ago I was in a gaseous section of the Marvin shaft, at Scranton, Penn.; it was in the evening. The mine foreman, two firebosses and myself were going in, and about 100 yd. from the head of the entry there was a board marked plainly "Gas," and laid across the track so that we had to step over it. Now, in that mine, no open lights were allowed at the face. We had gone, however, but a short distance further when we could see the glimmer of lamps that were evidently open lamps or torches, up the entry. The mine foreman said to us, "Wait a bit," and went quickly ahead to where the men were and made them extinguish their lights at once. We followed directly and found the foreman giving the men a calling down for taking their open lights beyond the board. Later, I said to the foreman, "Is that all you are going to do to those men?" His reply was "We cannot afford to discharge good men, at this time; good men are hard to get. I know it is a violation of the law, but we cannot help that; we are not going to let a good man go for a little matter of that kind." Proceeding a short distance further, at the inby corner of the last breakthrough, holding a lamp just inside of the corner, we could get a lamp full of flame. We could not get into the head of the entry on account of its being full of gas and therefore unsafe to enter. It was only good luck that no accident occurred at that time. A small fall of roof in the head of the entry would have driven the gas out on those men and the explosion that would be sure to follow would have blown them to pieces and endangered the life of every man in the pit.

But I would rather listen to you. These are only suggestions that come to me; there are many others; but I know that you can give many incidents and arguments for and against the use of mixed lights. I can only say that the excuse for the use of open lamps in mines generating gas is, as we all know, that the miner can see to mine coal better, and for that reason they do not care to use a safety lamp. My opinion is that we ought never to use a safety lamp where it can be avoided, that is to say, where the mine can be made safe to work with open lamps; but this must be done by having ample ventilation.

LIGHTING THE GAS A FOOL TRICK

The practice of using open lights beneath a layer of gas at the roof, where we are cautioned not to raise the lamps and where the boys will light the gas, just to see how it affects you or some greenhorn in the mine, such fool practice is to be condemned by every true miner. I was in one of the mines, I forget which one, at Scranton, some years ago, and there was a layer of gas at the roof of every chamber in one portion of the mine, at least. The gas was being given off at the coal face to that extent that it just maintained a thin layer continuously, close to the roof, at the face, and we were cautioned to keep our lamps down and did so. I had with me, at that time, a

commercial man who had never been in a coal mine before. He came there to get a little idea of what a coal mine was like. On retiring from the chamber we had not gone more than probably 75 or 100 ft. from the face when the boys for a joke, laid down and raised their lamp into the gas and lit it. The flame rolled down toward us and came within 20 ft. of us. I ducked and pulled my friend down. When he saw the flame had fallen back again and we were out of danger, he said, "What did you duck for?" But the mine foreman answered him very promptly, "A good miner always knows when to duck," which is very true. It must be remembered that an explosion does not develop immediately on the ignition of the gas, which will burn a certain distance and then recede and again advance and fall back a second or third time; but that action of the gas, in many cases, develops energy enough presently to burst into an explosion that extends more or less throughout the mine.

MR. McALLISTER (*Illinois*)—How many years ago was that?

MR. BEARD—That was in 1905.

MR. McALLISTER—I don't think you will find those conditions existing today in the mines.

MR. BEARD—Around Scranton? That is the condition today, in some of the mines near Scranton.

MR. RODERICK (*Pennsylvania*)—Was that in the face of the workings?

MR. BEARD—It was right in the face of one of the chambers.

MR. RODERICK—Some of the inside chambers?

MR. BEARD—Yes.

ANTHRACITE (PENN.) PRACTICE

MR. RODERICK—I will state, for the benefit of Mr. McAllister, that that is a frequent occurrence in the anthracite region. Of course, the veins are higher than in most of the bituminous workings; and, in the rooms of a gaseous mine, even a wing brattice would not keep it back. Then they use nothing but batteries to fire the shots. The mines of the anthracite region that are gaseous give off an enormous volume of gas. You can catch it from the sides, coming from the roof, bubbling up in the ditches. It takes a strong current of air, and unless the air is kept up to the face all the time, there is liable to be a thin layer near the roof. Now, as a rule, the men work with their lights on the bottom, or else use safety lamps altogether. But conditions are improving and I don't think you will find many places today in that condition.

MR. McALLISTER—It is a fact, is it not, that the miners never see the roof in those mines?

MR. RODERICK—The Mammoth vein in the Hazelwood district and in the Schuylkill district runs from 30 to 35 ft. in thickness, and the miner with his small light hardly ever sees the top in those thick seams. On the pitch, of course, they get back to the top, by cutting the coal back, and leaving it under their feet.

PRACTICE UNDER ILLINOIS CONDITIONS

MR. BACK (*Illinois*)—In my district, in Illinois, there are some gaseous mines; but the conditions are not such as to require the use of safety lamps. In my opinion, if there were places or sections in a mine that should be worked with safeties, I would put the whole mine on

safety lamps. I think it is a wrong idea to use open lights in one section when other sections require safety lamps. I believe the use of mixed lights is dangerous, because it is always possible for some one of the miners to slip through and carry an open light into the gas; and there is the danger.

MR. ADAMS—You are supposed to put a policeman at the entrance of that section and not allow a man to enter it with an open lamp.

MR. RODERICK—I don't consider there is much danger in a mine that is giving off gas only; but if there is dust it might increase the danger. You can generally arrange a mine so that a large portion can be worked with naked lamps while the live workings should be put on safety lamps. It may entail the extra expense of keeping somebody there to see that no naked lamps are taken into the gassy section.

As an illustration, let me say I had charge of a mine at one time and the conditions were like what Mr. McAllister has described. The seam had a heavy pitch; the coal was very free and would run of its own accord after being opened out to the proper width. It would come to the battery as fast as you could load it out; but, at times, a place would stop running, and that would cause an accumulation of gas in the chute, above the battery, for the coal was making much gas. Although a good current of air was passing on the level, yet for fear of a fall in some of the breasts bringing the gas down on the gangway. I put that section on safety lamps and put a man there in charge. If a driver came in carrying an open lamp, it was taken away from him and he was given a safety lamp. That was the only section that they had to put on safety lamps, as I thought it was not right or just that the whole mine should be put on safeties because that one lift was dangerous, and I did not do it.

MR. FLYNN (*Alabama*)—If I understand this subject, it is not a question of what would be safe at one mine or two or three mines; but what would be a safe rule for all mines. Of course, there are exceptions to all rules and there are varying conditions in coal mines; but this question should be discussed from a general standpoint and a general practice. The question should be discussed in a manner to bring out the points as to whether it is advisable to lay down a principle that both open and safety lamps could be used in the same mine, at one time. I do not mean in any one particular mine in Pennsylvania or in Alabama, but in all mines; because in discussing this question, I suppose it is with a view of discovering whether it is advisable to have laws enacted prohibiting the use of mixed lights in coal mines.

I, for one, would never consent to the use of open lights and safety lamps in the same mine. While I have seen conditions where it would be considered safe, I have seen other conditions where it would be dangerous. But, if it is safe to work them in *ten* mines and dangerous to use them in *one* mine, then I say the danger in that one outweighs the safety in the ten, and it would not be a good practice to pursue.

THE T. C. I. MINES IN ALABAMA

I am going to give a little of my experience with the use of mixed lights in coal mines. When I accepted the position with the Tennessee Coal, Iron & Railroad Co., I found they were using safety lamps in the advance work-

ing places that were generating gas. I found on investigation that there was no law to stop it. I talked against it and advised against it; but the opinions of other mining men were opposed to mine. However, having accepted the position with the company, I had some authority and immediately recommended that no safety lamps be used in any of our mines. Most of our mines are making a little gas. Formerly, the rooms were turned and worked before the entry breakthrough was cut; and if those places were generating a little gas, it was the custom to give them a safety lamp until the breakthrough was made. We were continually having men burned under that system; some seriously, others not as seriously, but some fatally.

The question was asked: What are you going to do if you stop working safety lamps in those places? I replied: We are going to put the air in there; we will carry a line of canvas brattice from the crosscut to the face and conduct the air right to the face. In every room there will be a line of brattice from the heading to carry the air to the face. After some argument on the question the general superintendent agreed with me that that would be the best policy and immediately issued orders that safety lamps should not be used. If it was found that a place was not safe, work would be stopped until it was made safe.

No man in the mines of the T. C. I. Co. is now allowed to have safety lamps, except the firebosses and the bratticemen. The firebosses use safety lamps exclusively. We do not even allow a fireboss to wear a cap with a tin. The reason we made that rule was because one of our firebosses was burned and investigation showed that he had a cap with a light on it unbeknown to anyone. This man would go in the mine about 3 o'clock. No one would see him going in and when coming out he always hid his cap with the open lamp and no one knew he had it. He would come out, eat his breakfast and then finish his shift with a safety lamp. His open light, however, set fire to some gas and he was burned and died five days later. A man holding a lamp in his hand is not so apt to forget about it as one with a lamp on his head.

RESULTS OF EXCLUDING SAFETY LAMPS

Since we have adopted this system, I am glad to say that all last year (1912) we only had two men burned in all the gaseous mines we operate. This was caused by two miners, who came out of their room leaving the canvas torn down; and while they waited for another car there was a little accumulation of gas, which they ignited with their lamps, on returning to the face. All of our mines are operated now with open lights. We require our firebosses to examine every working place in the mines, each day before the men enter for work. He must mark the day of the month near the face of the coal. We do that to insure that he has gone up to the face; then he marks the date on the timbers as a reference mark. After he has done that he comes out and meets the men before they enter the mine and every man has got to pass that fireboss and ask as to the condition of his place. If the fireboss reports gas in a certain working place, the man is stopped and not allowed to proceed until the day fireboss and bratticeman have gone there and made the place safe. In my opinion, it is bad practice to allow open lights and safeties in the same mine.

MR. WILLIAMS (*Pennsylvania*)—I want to ask Mr. Flynn a question or two. In the first place, would you penalize the nine mines because the tenth, in your opinion, was dangerous? And, another question: Do you have gob gas in Alabama?

MR. FLYNN—In answer to the first question I will say yes, I would penalize the nine, if by so doing I can render the tenth mine safe for operation, and for the protection of the man in that mine. This is as it should be, and who would not do the same thing? In answer to the second question, I will say, we have some gob gas in Alabama; but not, perhaps, to the extent you have it in Pennsylvania. We have gas accumulate over the falls, where the ventilating current cannot reach. But in Alabama, especially in the T. C. I. Co.'s plants, with which I am most familiar, the old works are examined every two weeks by the firebosses. They must go into every abandoned and worked-out place and examine them for gas and if they find any, the mine foreman must immediately start to remove that gas.

MR. WILLIAMS—Does the T. C. I. allow men to work on the return side of the falls and only examine worked-out places once every two weeks?

MR. FLYNN—As a general proposition the air travels in a separate split in one or two rooms, and then joins the current. Where this is the case no gas has ever been detected in the old workings, or over the falls, or anywhere else.

THE FIREBOSS AND THE ALABAMA LAW

MR. McALLISTER—Does the law in Alabama require the date of the month to be put on the face of the workings?

MR. FLYNN—No, it is not in the law. The law provides that if the fireboss finds gas he must put a danger board across the entrance to those places. The law also requires that the fireboss must notify each man as to the condition of his place and each man must pass the fireboss station and see the fireboss before he is allowed to enter the mine for work.

MR. RODERICK—Does not the law require them to put the date of the month on the face of the working places?

MR. FLYNN—It does not.

MR. RODERICK—Why does he put it there?

MR. FLYNN—It is a rule laid down by the inspector that the fireboss must put the date on the face of each working place, but it is not the law.

MR. RODERICK—Then you require the fireboss to examine all working places whether they give off any gas or not?

MR. FLYNN—We do.

MR. KELSO (*Alabama*)—May I ask, why you are opposed to safety lamps in any one entry?

MR. FLYNN—Because it is a dangerous practice, for the reason that you give a man a safety lamp to work with and the drivers, watermen, tracklayers and other employees are constantly passing on the gangway and may enter the place with an open lamp.

MR. KELSO—I agree with Mr. Flynn on the wing-brattice proposition but not in respect to working with safety lamps. I believe he stated he had two men burned on account of their breaking down the wing-brattice. I think the men in the entry should also have safety lamps and if for any cause they have to leave their place for any length of time, they should examine it again before returning to work.

MR. FLYNN—It was the custom in the past, as Mr. Kelso well knows, that the fireboss on finding gas in a working place, in the morning, would take a piece of canvas and brush it out. Now, in a number of instances, the miner himself does not understand the operation of the safety lamp; does not know how to use it; or could not tell when the place was clear of gas. He would come in and put his lamp down and start to brushing out the gas, which would fire on his lamp. I can recall three or four instances that occurred that way when that was the common custom.

MR. RODERICK—When a place is generating gas, what is the standard shot?

MR. FLYNN—The maximum charge is two sticks of dynamite.

MR. RODERICK—Then I will say that is a very dangerous habit not to require safety lamps to be used in entry work. Take a mine generating any quantity of explosive gas, and suppose you strike a strong blower with a shot that a man might fire. Suppose he goes back to a place of safety and waits a certain length of time and the brattice was blown down by the shot so that the air does not reach the face of the entry. The man returns with open lamp on his head and lights the gas in the face of the gangway. I see no harm in using safety lamps in an entry or breast, after firing a shot and believe this should be done if the heading is giving off much gas.

MR. FLYNN—When a man shoots under these conditions, we have a day fireboss, and the man is not allowed to go back until the fireboss has been there and thoroughly examined the place for gas.

ORDERED MINE PUT ON SAFETY LAMPS

MR. DUNLOP (*Illinois*)—We in Illinois are not troubled with mines that generate explosive gas to any extent, although I believe the time is coming when we will meet the very conditions that you are speaking of. I want to relate an experience, however, that I had in Illinois. As inspector, I was familiar with the conditions at the mine, which was located at Cardiff. They were working two seams; the lower one was 12 ft. in thickness and worked on the room-and-pillar system, while the other was worked longwall, the coal being about 36 in. thick. In the longwall workings we never found any gas; but in the lower thick seam we were troubled with a good deal of gas. The longwall seam was worked from one side and the other thicker vein from the other side of the property.

When driving the rooms in the thick lower seam we could do exactly as Mr. Flynn has said and brattice the air to the face of the rooms; but when we started to draw pillars, falls would take place, and gas would accumulate in the hole above the fall and in the thin seam above the 12-ft. seam. I had to order the use of safety lamps where they were drawing pillars, as we could not direct the air current so as to keep the pillar workings clear.

I ordered them to use safety lamps entirely when drawing pillars. I was still afraid and the men who worked in the longwall mine, a mile away, were afraid of a gas explosion and they kept me in hot water for weeks there; and, for that reason, I required them, also, to put in safety lamps. If we could have done as Mr. Flynn stated and used a wing-brattice to clear out the gas from the top of those falls, it would have been the best thing

to do, but that was not possible. I was always afraid of a fall bringing the gas down on the men.

MR. FLYNN—How thick was the cover or what was the depth below the surface?

MR. DUNLOP—The depth to the lower seam was 258 feet.

MR. FLYNN—Would it not have been better to have drilled a hole from the top and let the gas escape?

MR. DUNLOP—It would be impracticable to drill holes over all that section.

MR. FLYNN—Don't they do that in Pennsylvania?

MR. DUNLOP—It would require a great many holes.

MR. RODERICK—Is there any law in Illinois by which you can compel the operator to put holes down to drain off the gas?

MR. DUNLOP—No.

MR. FLYNN—You have a law compelling them to remove gas, haven't you?

MR. DUNLOP—Yes, from the working places only. If there is an accumulation of gas any where that is dangerous we are required by law to make it safe.

MR. BURRIS (*Illinois*)—Did you require the men working in the longwall seam to use safety lamps?

MR. DUNLOP—Yes sir.

MR. BOLT (*Illinois*)—I want to ask whether or not as inspector you do not have the power to insist that all gas be removed from mines where it is dangerous, in Illinois. Suppose a mine in your district generated gas and the accumulation became dangerous, would you not have the authority to compel the operator to remove the gas?

MR. DUNLOP—I have just answered that question; the law requires that the mine be made safe.

CONDITIONS IN NEW MEXICO MINES

MR. BEDDOW (*New Mexico*)—I just wish to state that we have a similar condition at Dorsey, N. M., to that described by Mr. Dunlop. We have a mine that generates gas, and when they commence pulling pillars the gas begins to accumulate. They are now removing that gas by the air current. The system they use there is a kind of block or panel system. They turn seven rooms in each panel, leaving pillars between the rooms and barrier pillars 150 ft. thick between the blocks or panels. They only pull six pillars in each block; the pillar in the first room on the intake side is left standing. After drawing the pillars back a certain distance and the gas shows up, they put up a brattice. There is a crosscut in the face of each room, and they have always managed to have plenty of air to keep the rooms free from gas. I have been over there many times and have never found any gas on any of my visits.

EXPERIENCE IN VERY GASSY MINES

MR. WILLIAMS—I possibly may have as much experience with safety lamps, mixed lights and real gassy mines as any man here; and as each one must express his opinion from his own standpoint, I might venture to say we have conditions in Pennsylvania where it would be impracticable and dangerous to work certain sections of the mines with open lights. In one mine that I superintended, we carried the brattice within 10 ft. of the face, and still, at the face, we could get an explosion in the lamp in either of the two corners of the chambers. That

was with the same company that Mr. Flynn is working for now. You could get a cap on the return air; a cap $\frac{1}{2}$ in. high, with 200,000 cu.ft. of air passing in the mine. We had blowers that we could hear 300 ft. away.

During my term as inspector of the Connellsville region, I have seen large volumes of gas on falls, and it could not be removed without sinking boreholes from the surface. The method of mining is possibly 80 per cent. on the retreating system. They drive the entries to the boundary, leaving 84-ft. barrier pillars and with room pillars 10 ft. wide. Then they start back and draw the pillars on a regular fracture line. The first fall is not very high, but the second is higher and so on until the falls are so high they cannot get air over them and the only thing to do is to sink boreholes from the surface, to the top of the fall. In my present district, I have about 14 or 15 gassy mines; some are very gaseous and we could not work the entries, even if a brattice was carried to the face of the entry, without safety lamps. A current of 235,000 cu.ft. of air passes under a 6-in. water gage. The seam is not thick and we cannot get enough air to keep the faces clear of gas without the boreholes. The entries are driven wide, and the rooms are about 15 to 18 ft. in width, but in the lower corners we can get an explosion, at any time, in the lamp.

The law requires that, in all mines where safety lamps are used, men working on the return current must use safety lamps. It is strictly against the law to work with an open light, on the return side of any section of the mine where the safety lamps are used. I can realize the stand most of the members present are taking. They are basing their opinions on conditions at home, which is the best guide after all. Our firebosses examine every working place, without exception, all roadways and all falls adjacent to working places, twice each day. The mine foreman or his assistant also examines these places. When we find gas on the gob or the falls we take out everybody on the return side of the gob, as there is danger of the gas being ignited by a flaming shot or other cause.

MR. FLYNN—Is it not a fact that the H. C. Frick Coke Co. will not permit, under any circumstances, now, the use of open lights and safety lamps in the same mine?

MR. WILLIAMS—That is the policy.

MR. DUNLOP—You have mentioned gaseous mines. Have you any mines where they can use mixed lights at all?

MR. WILLIAMS—Yes. We have mines that are slope mines. A portion will be under light cover and on advancing into the mines the cover becomes heavier, and the conditions change. We are not requiring the use of safety lamps in those sections where we have never found gas or where the cover is light. We keep those air splits separate from the other sections of the mine and from the return air, and where we use safety lamps we keep a man to prevent an open light from going into those sections.

This closed the discussion.

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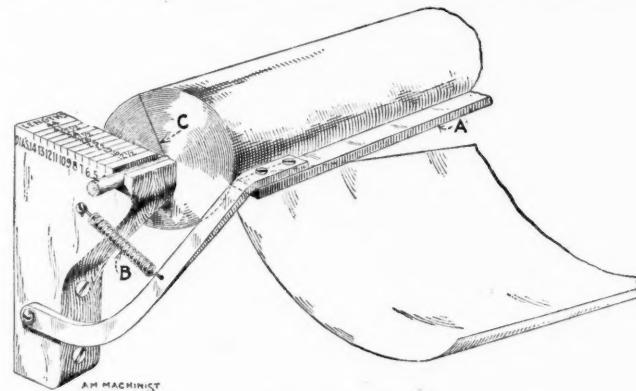
In regard to the use of feed water which contains scale-forming ingredients, one principle should always be observed, and this is to precipitate as much as possible of the scale-forming matter before the water enters the boiler. It is a barbarous practice to reduce the thermal efficiency of boilers and run the risk of pitting and corrosion by the introduction of alkaline reagents into the boiler itself. Such an out-of-date method is entirely unnecessary and should be avoided.

COAL AGE

A Drawing-Paper Support

Rolls of drawing paper are usually mounted on brackets as shown in the illustration, and to avoid the irregular cutting and unnecessary waste usually present in the drafting room, the following device was adopted with good results.

The steel bar *A* across the front of the roll presents an edge against which the paper may be torn straight; this bar is held tight against the roll by means of the springs *B*. One end of a new roll is marked radially with a rough pencil mark as *C*. The readings on the bracket from the



SKETCH OF A DRAWING-PAPER SUPPORT

center out, are the lengths of circumferences corresponding to the existing diameter of the roll.

Observing first the position of the radial mark, any length required is approximated with little waste by means of the scales on the brackets, halving, adding, or doubling, as the case requires.—*American Machinist*.

3

Engineers' Society of North-eastern Pennsylvania

The Engineers' Society of Northeastern Pennsylvania held its 17th annual meeting in the banqueting hall of the Hotel Jermyn, Scranton, Penn., on the evening of Feb. 5. There were about 325 members present. President H. M. Warren remarked that the attendance at Scranton was larger than the record gathering at Wilkes-Barre, the year before.

The Scranton Engineers' Society a short while ago changed its name to that given above and about the same time it took on new life. As Mr. Warren declared, it has doubled its dues from \$5 to \$10 and has concurrently increased its membership from about 300 members to 409, despite all the prognostications of those who opposed the increase in annual charges.

It has also purchased a large dwelling, just back of the Y. M. C. A. building, and has fitted it for a club house. The charges of \$25,000 for the building and \$5000 for the remodeling have entailed a considerable burden on the society, and committees have been formed to wipe out both these debts.

E. R. Pettebone, the incoming president, regards his office as much a burden as an honor, a sure earnest of activity on his part and an evidence that he believes that much responsibility rests on him to perform diligently the duties of his office. The mayor, E. B. Jermyn, might cheerfully anticipate a membership of 1409, but E. R.

Pettebone set himself no standards for fear of disappointment.

Judging by the roster of speakers, one would not think that coal-mining engineers form the bulk of the membership. The toastmaster was W. D. B. Ainey, a member of the Federal House of Representatives and a delegate to the Hague Peace Congress. The principal speakers of the evening were: N. P. Lewis, chief engineer, Board of Estimate and Apportionment, New York City, who spoke on city planning, and Hudson Maxim, the inventor of explosives, who addressed the audience on "The Truth about our Peace and War Problems."

E. A. Jones, second deputy state highway commissioner, stationed at Scranton, spoke in place of E. M. Bigelow, and deplored the fact that the funds of the department did not permit of adequate support being given to the township officials in the repair of roads. In place of J. A. Holmes, the director of the Bureau of Mines, H. C. Reynolds addressed the society on the "Engineer as an Expert Witness." The speech-making ended at about 12:30 p.m.

The Answer

BY ROBERT LANG*

A reply to Mr. Braley's poem "The Question," which appeared in "Coal Age," Jan. 31, 1914.

What has been done with our aged men,
Is a theme that has ever been sung.
But a question of greater moment is—
What has been done with the young?

When the fires of youth are all aglow,
And the world is moving fast,
Does the young man ever pause to think
That age will come at last?

That the hand of time gets a strangle grip
On the over-impulsive heart,
And the ardor of youth burns low and dies
Ere the body and spirit part?

Think not of age, my miner friend,
Or what will become of the old.
If you spend your years in a search of truth
You will safely enter the fold.

Mine Explosion Said to Have Been Caused by Acetylene Gas

Deputy Mine Inspector Gaffney of Ohio is reported as saying that the mysterious explosion in the Wheeling Creek mine, near Bridgeport, Ohio, was caused by the ignition of accumulated acetylene gas. After a careful investigation, Mr. Gaffney eliminated both firedamp and powder as causes of the accident.

It was discovered that two powder cans filled with refuse carbide from the lamps of miners previously employed in that part of the mine had been placed in this same chamber nearly two months before. By actual test, when the cans were taken out of the mine, the refuse carbide, under the same conditions that prevailed underground, gave off enough gas to ignite and cause a flame. It is believed that the unfortunate miner was killed by

*Superintendent, Galloway Coal Co., Garnsey, Ala.

crawling into a chamber filled with the acetylene gas, which he ignited with the naked light he carried on his cap.

Chief Mine Inspector Davies was on the scene after the accident occurred, and stated that the case was one of the most remarkable he had ever experienced.

¶

Ohio Anti-Screen Law Passed

The Green mine-run bill, which provides that miners shall be paid for all coal produced, and not permitting a screen to be used, was passed last week. The vote in the House of Representatives was 103 to 8, which shows the hopelessness of the contention of the operator against the measure. Only one amendment was embodied in the bill as it came from the Senate, and that was to make it effective in 90 days, instead of Oct. 1, 1914, as provided in the original draft of the bill.

Just what action will be taken by the Ohio operators is still a matter of conjecture. There are several courses open and the operators are considering the best one to follow. There is the referendum which can be used if sufficient signatures to a petition can be secured, but that is a long fight and then the voters of the state may decide to uphold the action of the legislature.

Another course is to violate the law and have the matter in the courts, where the constitutionality of the measure can be tested. This appears to be the most feasible course to follow.

The cost of changing the tipples in Ohio to conform to the requirements of the new law will be almost \$1,000,000, it is believed.

¶

Bosses To Be Nonunion

Eriton shaft, an operation of the Northwestern Mining & Exchange Co., an affiliation of the Erie R.R., went on strike Dec. 1, 1913, to compel a boss fireman to join the United Mine Workers of America. The following proposition was submitted by the company to the workmen and was adopted by them on Jan. 22, after the men had been idle eight weeks.

To All Employees at Eriton Mine—We are ready to resume work at Eriton mine, just as soon as it can be gotten in shape for resumption of work, with the distinct understanding, however, that you restore our rights and conditions to the same basis as they were when you suspended work and closed our mines, and with the further distinct understanding that the following positions and the men filling the same, now or hereafter, shall be exempt from membership in the United Mine Workers of America.

The positions referred to are as follows: Superintendents, mine foremen, assistant mine foremen, firebosses, motor bosses, machine bosses, boss firemen, weigh bosses and master mechanics.

We agree, however, that the boss fireman who is now a member of your organization, may, if he so desires, retain his membership therein until Apr. 1, 1914. We agree further, that neither the members of the United Mine Workers of America nor our officials will hold any personal prejudice against any man employed at Eriton mine.

If the above proposition is accepted by the men at Eriton, those whose places are in condition for immediate resumption, can begin work just as soon as arrangements can be made for proper day forces to take care of same, which arrangements will be rushed with all possible haste.

JOHN H. FULFORD,
General Superintendent.

Du Bois, Penn.

This proposition was accepted with but four dissenting voices in a meeting where 500 were present.

The Close of the Indianapolis Convention

EDITORIAL CORRESPONDENCE

SYNOPSIS—The scale committee urged a 5c. increase in miners' wages, and a 10 per cent. increase for day labor, inside and outside, and for dead work. Despite the attempts of the radical element to call for a 10c. increase, the decision of the convention was in favor of demanding only a 5c. raise in the pay of the miners.

We confess to a sense of increased confidence in the United Mine Workers of America as a result of the Indianapolis convention. In every large body, it is a foregone conclusion that some men will be found with peculiar views, anarchistic, socialistic and syndicalistic, but the convention in its closing hours sailed quietly into port under the steady hand of John P. White. He has winked and connived at the radical element and so has been deserving at times of the severest censure, but at heart he really *believes* in being fair in his dealings, even when his acts belie his statements. When he does what is wrong, he does it as subordinate to the rough-and-tumble element and not as leader of his organization.

THE SCALE ADOPTED

The "scale," which was adopted as read, is as follows:

1. That all coal be weighed before being screened, and be paid for on a mine-run basis.
2. That we demand a flat 5c. a ton increase at the basing point.
3. A 10 per cent. increase on all dead work, yardage and day labor.
4. A uniform workday and wage scale for all classes of outside and inside day labor.
5. A proper adjustment of all machine differentials at the basing point.
6. That we demand a complete check-off for the miners' organization through the company's office.
7. That we demand that all the local inequalities and internal differences be referred to the various districts affected for settlement.
8. We demand that where the price or regulation of powder is made a contract provision that union-made powder shall be furnished.
9. That the miners work only one-half day on Saturday.
10. That the company shall pay drivers for time from taking charge of stock until the company receives the same.
11. We demand that our contract shall be in effect for two years.

THE MINE-RUN PROVISION

That part of the scale which will arouse strong opposition is the first section: That all coal be weighed before being screened and be paid for on the mine-run basis. As Illinois operators and many in Pennsylvania now run their plants under contracts of this kind, and as Ohio mine owners are about to be compelled to adopt this method by legislation, it is probable that they will use strong pressure to make the operators in other states accept the new arrangement of their affairs.

The almost universal use of machines favors the miners' contention. There is little call for excessive use of powder after the coal has been undercut to the requisite depth, and lumps of coal can be just as easily lifted, and thrown or built up on the car as they can be shoveled in as slack. The objection will partly come from the smaller operator, who has no money to buy machinery and hesitates to accept the risk of adding to his indebtedness. Much opposition will come from those operators who are unable to remove pillars by machinery.

The main difficulty will arise in determining the true equivalent between a mine-run scale and one based on lump coal only. The fear that the miners intend to be unreasonable in the making of this change, and the idea that the miners want to obtain pay for their slack equal to that now paid for lump coal, makes the change in scale rating exceedingly unpopular among the operators, and with good reason.

The scale committee consisted of the following members: Van Bittner, District 5, chairman; Joseph Pope, District 12; John Moore, District 6; William H. Houston, District 11; Lawrence Garrigus, District 8; John T. Dempsey, District 1; Patrick Gilday, District 2; Thomas Kennedy, District 7; James Matthews, District 9; Martin Flyzick, District 10; W. H. Rodgers, District 13; Alex Howatt, District 14; John McLennan, District 15; Thomas Cairns, District 17; J. E. Smith, District 18; Pat Cary, District 19; J. R. Kennamer, District 20; P. R. Stewart, District 21; A. G. Morgan, District 22; L. B. Walker, District 23; Joseph Smith, District 24; George Manuel, District 25; Henry Drennan, District 27; L. C. Rodgers, District 29.

Casdrole, of the Pittsburgh district, moved to amend the second demand so as to increase the miners' wages 10c. instead of 5c., but J. W. Jarrard, of Johnson City, Ill., came to the defense of the scale committee's report. President White spoke for a demand which would not disturb industrial peace. He did not believe in trading back and forth, and thought the convention should ask for what it wanted and expected to get.

THE KENTUCKY MINERS WANT THEIR WAGES RAISED

The Kentucky miners, through George Baker, wanted the convention to assist the miners of his district, No. 23, which was surrounded by nonunion fields. He said: "We are working for 16 $\frac{2}{3}$ c. a ton less than the miners in adjoining states, and the rate for dead work and day labor is 35 to 60c. a day less." Eventually a resolution was passed pledging the miners in southwestern Kentucky that the union would use every endeavor to unionize nearby and competitive coal fields.

President White strongly opposed a suspension pending an agreement with the operators. He placed the blame on them for the report that such a suspension would occur. He said they urged it only because they wished to rid themselves of surplus stocks.

INDIANAPOLIS DISCIPLINED FOR FAVORING OPEN SHOP

The vote to choose a convention city favored St. Louis. Indianapolis received only 19 votes, but Kansas City was a strong competitor, being only beaten by 80 votes. It is thought that as a result of a referendum, the number of delegates will be considerably reduced by the next convention. Each district will elect as many delegates as there are thousands of members, and the delegation will not be elected by the local unions. But there seems no sense in arranging to meet at St. Louis and waste by travel what is economized by reduction in numbers.

The president's salary was raised from \$3000 to \$4000 per annum, and the secretary-treasurer received at the close of the meeting an increase in salary from \$2500 to \$3300. The stipend of the editor of the *Mine Workers' Journal* was also raised from \$1500 to \$2000 per annum. The international board members' pay when employed was raised from \$4 per day to \$125 per month.

Editorials

Should Strikes Occur?

Speaking at the last winter session of the Coal Mining Institute of America, Harrington Emerson, the well known efficiency advocate said:

A strike seems to me not only a preventable, but a ridiculous, stupid thing like the sinking of the "Titanic" or the wrecks on the New York, New Haven & Hartford R.R.

Adverse comment on this bold and perhaps largely untrue statement was made by several of those who discussed the paper. We reproduce it, however, because it is so confident that it focuses one's attention and makes one question just how much truth there is in it.

We cannot overlook the fact that the United Mine Workers of America is organized for strife and to a degree its continuance depends on its discovering wrongs, real and fancied, for which it can demand a remedy. On the whole, however, a more enlightened spirit would demand that the union be kept like a modern army as an insurance against oppression rather than for aggressive purposes. There are men who irk at paying life and fire insurance, because the need of either is so rare. Men tire of paying union dues for the same reason, but nevertheless a prudent man will consider the best union one which protects its members without a strike, without even a suspension. The army fulfills its purpose most successfully when it does not fire a shot.

We must also remember that the object of the direct-action advocates is to foment perpetual strife and arrange for a strike whenever the operator is least desirous of such an annoyance. Such people, we believe, will soon tire of the strenuous course they have marked out. In fact, there is even now a lull which seems to indicate that syndicalism has exhausted its advocates, physically, mentally and morally.

The toll of hate is heavy on its followers, deranging their digestive organs, preventing restful nights and overthrowing the reason. Economically also, it impoverishes at least the rank and file. It cannot continue forever. Orgies of hate have arisen again and again in history and after a period, longer or shorter, died away, not without, however, leaving grievous scars.

As for the coal operators we must say that to some extent they are to blame for the frequency of strikes. They do not, it is true, meet and willfully decide to risk a reduction of wages every year or two. If the miners would show signs of being willing to continue at work at the old figures there would be no desire on the part of the operators to seek a reduction. An attempt to change the scale downward is such an unsettling factor in business that the operators as a whole are almost always opposed to it.

They do, however, frequently ask for a reduction, in order to countervail a demand for an increase. It is a foolish practice, and to be deplored. It brands the operator as seeking something which is unreasonable. With the cost of living going up, can any operator anticipate that a strike will end with a reduction of wages, without creating the most bitter of feelings and the maledictions of the public?

We have previously advocated that wage increases be based on the index of increased cost of living. We would suggest that contracts be made for five years on that basis, increases being made year by year proportional to any increase in the cost of living, plus a certain percentage, say a half per cent. per annum, justifiable on the ground that the workingman should receive not only the power of purchase of similar goods year by year, but should be able to buy more products as the labor of producing them decreases with the introduction of machinery.

Let the operators rest their wage scales on science, let them advertise in the press their method of basing those wages, and the people will be obliged to admit that they have an extremely plausible case. But asking for reductions at every readjustment puts them on a level with an Arabian peddler, and is unworthy of the one-price merchandizing of this present century.

Will the time ever come that the operators will be able to celebrate like the United States and Great Britain, a centenary of peace? Some individual companies there are, which have never had a strike, and perhaps a time may come when the hand and the head in the industrial being will never enter into conflict.

Our Mercantile Marine

Ex-Governor McCorkle pleads for a mercantile marine in the article we publish today, and says it would materially increase the foreign coal trade of the United States. The foreign mercantile shipping is a favorite matter for discourse in the halls of Congress and in daily journalism. We cannot blame Mr. McCorkle for humming a tune he has heard played so often and so alluringly.

But as a matter of plain fact the British and Scandinavian marines have been denationalized for years. They would carry American coal with just as good grace as British, so long as they could earn a liberal profit. The only argument for building a national mercantile marine we can see is that it will be a help to our navy in time of war.

In peace we can hire foreign ships to carry our coal if there is money in the traffic; if there is none, let us compel the representatives, senators and newspaper men to undertake that obligation without any bounty. The argument for the mercantile marine is purely naval and its validity stands or falls on that score alone.

During the British coal strike of March, 1912, business in Europe sank to an extremely low ebb and a number of steaming vessels were without cargoes. They came over to America and loaded up with coal for the Mediterranean and they were willing to accept almost any figure for the service.

Conditions in Europe improved as the strike ended; the price of coal fell in the Mediterranean ports and only with difficulty could American coal continue to pay the freight charges existing. But to make matters worse, ships were attracted to Europe to engage in their old

trade and the shipping rates to the Mediterranean went up to their former level. Immediately the cry was raised that the Briton was at his perfidious tricks and was raising rates on cargoes in order to keep the coal of this country from proving its worth in the market.

It is the old story and should we subsidize a mercantile marine, we can well write its sequel. Just as soon as such an organization is formed, it will engage in the trade most profitable to it; some ships will carry alien products to foreign ports and the jealous metropolitan dailies will say the ship owners have been bribed or coerced into neglecting the needs of the nation and favoring foreign coal.

* * *

Our Foreign Trade

We commence to publish today a remarkable address delivered by W. A. McCorkle, an ex-governor of West Virginia, before the West Virginia Mining Institute. We have read many articles on the foreign trade, and found quite frequently that they did not seem to confront the main difficulty, which may be thus stated: Any country which will not *buy* quantities of bulky foreign articles cannot expect to *sell* abroad a hold-filling product like coal, which is mined on every continent and in nearly every country.

It seems strange to the man on the street that America can supply Europe, Asia and Africa with grain, meat and machinery and cannot sell coal, though the greater part of the three continents have inferior fuel and in some parts none at all. It seems stranger to him to hear that because we ship so many products to Europe is the reason why our coal is excluded and stranger yet it seems that our large export trade with Europe is the cause for coal being shipped from Europe to America in times of industrial conflict in this country.

But it is clear that in order to transport coal to Europe cheaply, we must have a return cargo for the vessel and that the lading on the return voyage must be capable of standing a heavy freight charge or the transportation rate will be unduly heavy. The British coals find the return traffic good; the American fuels discover it almost entirely lacking and so despite the lower price at the coast, the coal of the United States remains without transatlantic and Pacific demand.

Ex-Governor McCorkle realizes some of these facts and it is a wonder he does not see that conditions are similar all over the world except in North America and the eastern littoral of South America. We have a big commerce with the Caribbean Sea; from Cuba, iron ore; from Honduras, mahogany and other woods; from Guatemala, bananas; from the Bermudas, potatoes and onions; from Venezuela and Porto Rico, coffee. So there is no difficulty in the carriage of coal to these ports or others near-by, such as Colon, especially as boats can safely go light to that port over waters that are still. What is true of Panama is therefore no indication of conditions beyond it.

It is a wonder that Mr. McCorkle does not realize that nearly all the Pacific is more a prospective purchaser than a probable seller to the United States and as its freights will always be larger west than east, coal will find no opportunity for carriage. We must compliment him, however, on knowing that the direction of transportation will depend not so much on the relative distances but on the cost of coal along the route.

But disagreeing with Mr. McCorkle, we must advise West Virginia against too great a faith in Panama as a market. It is further away, it is true, from the center of ocean freightage in Europe than Suez and may, therefore, sell more coal to European ships as soon as its traffic is as large as that of the Egyptian canal. But for many years its tonnage will be much smaller than that of Suez.

And it is significant that Egypt imported from Great Britain during 1911, the last prosperous year of which we have record, only 3,476,780 short tons. The following year probably as a result of the strike in the British coal fields only 3,276,924 short tons were purchased. Malta and Gibraltar took together 860,754 short tons in 1911 and 916,410 short tons in 1912.

The tonnage sold to Gibraltar, Malta and Egypt per year is less than the increase in output of the state of West Virginia in 1913 by about 1½ million tons. If West Virginia is hoping for a rapid growth on the basis of actual Panama trade, we are afraid a disappointment is in store. The foreign trade of Great Britain is a prize worth seeking. It absorbed 85,889,710 tons of coal in 1913, some of it being shipped in manufactured forms such as coke and coalite. This is equal to the output of West Virginia and Indiana in the same year. If all this foreign trade could be absorbed by the United States it would add 15% to its business, as large an increase as would normally be added by five years of domestic advance.

However, it begins to look less significant when we state that three counties in Pennsylvania, Fayette, Westmoreland and Luzerne, produced in aggregate 10,000,000 more tons in 1912 than Great Britain exported in 1913. Eventually, the British miners with their notions of restriction of hours, limitation of output, minimum wage and a hundred other crippling demands will give us all the foreign trade of Great Britain. In this they will be aided by the natural conditions, greater mining depth, irregularity of coal beds and depletion of coal resources. But we may be sure, on the other hand, that Great Britain will not lose this trade for many years.

We do not think that the Panama canal will have a great effect in stimulating the coal trade. Certainly a liberal discount can be made on the rosy anticipations of our would-be exporters. Meanwhile, it is amusing to read the alternate hopes and fears of the British technical press. Now they expect to keep the eastern coast of America supplied with their "incomparable coals" and then the trade balance shifts and the Yankee peril looms up like the Genie of the bottle.

The arguments, if such they may be called, for a rearrangement of the balance of coal trade in the world have been made mainly by visionaries and pessimists and we do not look for any sudden readjustment at the present time.

* * *

The United Mine Workers of America, at Indianapolis, adopted a new section to the constitution providing that sick, accident and death benefits may be established in any district, sub-district or local union, whenever a majority of the members of the respective bodies so determine. This aroused much opposition from Delegate Summerville, of Ohio, who said that had a benefit fund in his local lasted another six months, all the members would have been sick.

A Model Town in West Virginia

The Lackawanna Coal & Lumber Co., which owns, in fee simple, about 30,000 acres in one tract in Boone County, will begin an extensive coal operation there in the late spring or early summer.

This new development will be on Hopkins Fork, a branch of the Laurel Creek, the latter being a tributary of the Coal River. It is about nine miles from Seth, which is on the Coal River division of the Chesapeake & Ohio R.R. The new town will be called Griffith, being so named for the vice-president of the company. The new town of Griffith will approach the model village as nearly as possible. The plans for town and tipple have already been completed.

In laying out the town, the company has followed newly approved ideas in sanitation and hygiene and has sought the advice of sociological experts. It is expected that there will be about 300 houses for the miners. These will be erected on plots large enough to give each family a fair-size lawn and adequate garden space. They will be roomy and all of them will have running water in them and will be lit with electricity or gas.

Due attention will be paid to living conditions. Near the tipple there will be a large bathhouse for the miners, and each miner will have his own locker. There will also be two club houses. A hotel will be provided for the accommodation of travelers. A skating rink will also be built and, near it, a moving-picture theater. Here the company officials expect to show many pictures that will illustrate the latest methods in mining and will also help to teach the miners how accidents may be prevented. But films of a purely entertaining nature will not be forgotten.

The railroad from Seth to Griffith, about nine miles, has been completed about a year and the company has been using it in its lumber operations. It is estimated that there are 300,000,000 tons of coal in this tract. The officers of the company are W. L. Connell, of Scranton, Penn., president; J. K. Griffith, of Pittston, Penn., vice-president; T. J. Foster, of Scranton, treasurer, and David Connell, of Scranton, secretary.

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Recent Legal Decisions

Right of Individual Bondholder to Sue—Provision in a mortgage or deed of trust securing bond, prohibiting individual bondholders from bringing foreclosure suit on default, does not prevent suit by them to recover defaulted interest, without foreclosure, unless such provision extends to such suits, as well as suits to foreclose, by virtue of its express terms. (St. Louis Court of Appeals, Muren vs. Southern Coal & Mining Co., 160 Southwestern Reporter 835.)

Mine Operator's Responsibility for Co-Employee's Negligence—Under the laws of Missouri, a coal-mine owner is liable for injury to a mine resulting from a defective condition negligently created by a fellow miner, as where the latter leaves a dumped empty car so near a track that another miner is injured, without fault on his own part, in driving by it. (Kansas City Court of Appeals, Martin vs. Farmers' Coal Co., 160 Southwestern Reporter 816.)

Mine Operator's Duty to Furnish Props—Duty to Warn Minor Employee—The requirement of the laws of Kentucky that mine operators shall furnish props to secure the roofs of their working places extends to the supporting of draw slate, as well as permanent mine roofs. This duty is not affected by the fact that a miner is employed under contract to remove coal at a fixed rate the ton. It is actionable negligence to permit an inexperienced boy miner to work under dangerous conditions against which he is not warned. (Kentucky Court of Appeals, Interstate Coal Co. vs. Trivett, 160 Southwestern Reporter 728.)

American Institute of Mining Engineers Organize Anthracite Section

A subdivision of the American Institute of Mining Engineers, to be known as the Pennsylvania Anthracite Section, was organized at the Sterling Hotel, in Wilkes-Barre, Saturday evening, Jan. 31. Among those present at this initial gathering were Charles F. Rand, president, and Bradley Stoughton, secretary of the national organization. About 50 other engineers and company officers of the different anthracite corporations attended the meeting, and signified their intention of joining this new section of the Mining Engineers' Institute. R. V. Norris, of Wilkes-Barre, was chairman of the evening. Among those who spoke were H. M. Chance, chairman of the Coal and Coke Committee; Prof. J. W. Richards, Lehigh University; W. J. Richards, vice-president of P. & R. C. & I. Co.; R. J. Foster, Scranton; J. D. Davis, Kingston; and C. F. Huber, Wilkes-Barre. An executive committee was elected and is composed of the following members: R. V. Norris, chairman; W. J. Richards, R. J. Foster, Edwin Ludlow, C. F. Huber, Douglas Bunting, F. A. Hill, Chas. Enzian and J. M. Humphrey.

Those present were:

Thos. Thomas, E. R. Pettebone, H. G. Davis, H. M. Crankshaw, J. B. Warriner, H. W. Montz, Chas. F. Rand, Bradley Stoughton, H. M. Chance, Geo. P. Gallagher, Wm. Griffith, S. J. Jennings, E. C. Lee, W. D. Owens, Frank A. Hill, W. J. Richards, G. W. Engel, Rufus J. Foster, F. A. Gleason, Jos. W. Richards, W. R. Crane, Alfred G. White, H. H. Ashley, Douglas Bunting, Wayne Caruthers, E. M. Chance, F. M. Chase, W. F. Dodge, Chas. Enzian, M. S. Hachita, G. T. Haldman, Chas. F. Huber, J. M. Humphrey, John Lloyd, F. J. McMahon, R. V. Norris, Wm. E. Shearman, A. C. Stahl, Paul Sterling, P. Wainer, T. L. Welles and F. E. Zerbey.

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Cost of Machine Mining in Pittsburgh District

The following table of the cost of machine mining in the Pittsburgh district was compiled by Jesse K. Johnston, vice-president and general manager of the Pitcairn Coal Co.:

| COST OF MACHINE MINING PER TON | | |
|--------------------------------|--------------|-------------------|
| 1897 Cutting | 1912 Cutting | Per Cent. Advance |
| Rooms | \$0.1244 | 65.86 |
| Entry | 0.1644 | 56.57 |
| 1897 Loading | 1912 Loading | Per Cent. Advance |
| Rooms | \$0.5356 | 91.29 |
| Entry | 0.6537 | 92.27 |

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Miners' Convention Cost \$130,000

The Indianapolis convention lasted about 13 working days and cost about \$130,000. The funds of the union, therefore, must now be about \$150,000, or roughly 4^{1/2} per member. The advocates of direct action are strongly opposed to unionism, because they say it tends to conservatism, and they are right. Surely when the union men realize how their funds are continually depleted, they must understand, and in a degree sympathize, with the capitalist, and must realize that the large aggregations of capital, with their appalling figures, shrink into insignificance when the whole population serves as a denominator in determining the individual possession.

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A good feed pump requires from 1 to 1 $\frac{1}{2}$ per cent. of the steam generated to deliver the necessary amount of feed water.

Discussion By Readers

How to Buy Coal

Letter No. 2—The several discussions of this question in past issues of COAL AGE have led the ordinary reader to believe that our present B.t.u. method is obsolete and beset with inaccuracies and that the system is on the decline. This may be true, but not to an alarming degree. It is safe to say, however, that its worth is not declining any more rapidly than it was taken up by the bituminous coal industry in general. It is necessary for the small as well as the larger consumers to have some standard and some method by which to gage the quality of their product, and for the want of something better the chemist is compelled to resort to this determination to arrive at some sort of a tangible figure.

The insurmountable obstacle to this proposition, as stated by Mr. Burrows, Vol. 4, p. 866, is in sampling. Accordingly, I think that the statement that the B.t.u. method is obsolete should be modified and the direct cause of imperfection be attributed to sampling, where it properly belongs, and not to the chemical method employed to determine the heating value of the coal. The correct sampling of all coals, ores, cement, etc., is one of the most difficult propositions known to the chemist, and while he may err on a few samples, yet his average analysis of a product, for a period of 365 days, is sufficiently correct for most commercial computations.

Periodic sampling of a small lot of coal and subsequent thermal determinations may not reveal the true value of a coal; but where a tonnage of several hundred tons a day is used, and the material sampled after plant crushing, the sample and analysis ought to be considered a fairly accurate indicator of the heating value of the coal. I am informed that large consumers do not accept analytical results from samples taken directly from the cars.

It is stated that the railroads and government have discontinued the heat-unit specifications, which, no doubt, is the result of being now in possession of complete chemical information, after years of investigation, of all the coal fields of any importance in this country. Assuming that given coal seams and districts produce coal quite uniform in quality, it is possible, now, to purchase the coal by trade names with fair satisfaction, and without entailing the cost of analyses. Shall we assume that the scientific force and value of analyses have been displaced because of this connection with politics? The analysis of a coal should be a shield for a public officer, whereby he can avoid suspicion of showing partiality in giving contracts of public tenders.

It is universally acknowledged that coal-burning apparatus must be adapted and proportioned to suit a particular fuel; but must not the character of this particular fuel, in the first place, be determined by chemical and physical tests? The chemical analysis should never be the final word as to the value of a coal, yet its chemical composition must be known, to some extent, for the benefit and help it will prove in the correct operation of a power plant.

In regard to inconsistencies in coal specifications, it is assumed that in modern specification systems where large tonnages are used, suitable provisions are made for every element and the behavior of the fuel in the furnace.

The trouble of the small consumer and dealers who handle two- or three-carload lots and probably get their supply from a number of different mines and districts in using this method should not condemn its use in other operations.

Specifications, however, should not work a hardship on the smaller dealer. Let the mine operator carefully ascertain the grade, adaptability and quality of his product; and then sell and guarantee it for the purposes for which it is best suited.

If we cannot reasonably rely on the present B.t.u. method why pay any attention to the ash and sulphur results. If we discard the one, which is dependent on the others, then our whole system of coal analysis is incorrect. Until a better method than the present is devised, I think that the present one is relatively accurate for assessing the thermal value of a bituminous coal, under proper sampling conditions.

J. V. FREEMAN.

Joliet, Ill.

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The Mine-Run Problem

Letter No. 1—I have read with much interest the two articles analyzing the Ohio Mining Commission's report, COAL AGE, Jan. 24, p. 167; and Jan. 31, p. 196, and discussing the question of paying the miners for the nut and slack coal on what is known as the "mine-run system." It occurs to me that there should be some equitable solution of this vexing problem.

The discussion of the question in Ohio has resulted in the passage by the House, of the "Green Anti-Screen bill." There are many views as to the wisdom or expediency of such legislation. It appears to me, however, but just and right that the miner should be compensated for the handling of the finer coals, such as nut and slack, that pass through a 1 1/4-in. screen. In Kentucky, these "fines" amount to from 35 to 40 per cent. of the total coal mined and loaded on cars.

There are many cases where operators pay for the coal mined on a mine-run basis, but the price paid is generally about 42 per cent. less than the rate paid for screened coal. In innumerable cases, the payment for mining on this basis has imposed grievous hardships on the operator, as many miners seek to secure greater weight by an excessive use of powder in the mining of the coal. In every mine, there is a certain class of miners that will follow this practice, regardless of the large increase of screenings produced thereby, in order to increase their own daily output and lessen, to some extent, the labor of mining. Where this practice is followed, the impurities of the coal, slate and clay are reduced to such fineness that the smaller grades of coal are comparatively valueless, except as they are further prepared by washing. Few of the

smaller operations can afford the increased cost of washing these lower grades of coal and, except for coking operations, the process is hardly justifiable.

In my opinion, the rate of payment on a mine-run basis should be adjusted by a careful determination of the proportion and price of the two grades of coal. At the present time, the screenings, nut and slack, bring in this market 50c. per ton, while the lump coal is sold at \$1.65 per ton. If we assume the price of mining screened coal is $87\frac{1}{2}$ c. per ton, the mining price for screenings, if taken proportionately, would be $1.65 : 0.50 : : 0.875 : 0.265$; or, say $26\frac{1}{2}$ c. per ton. In this manner, it seems to me that an equitable price could be fixed for the payment of mining coal, on a mine-run basis. The adoption of some such system would go far toward settling the seemingly never-ending dispute. The miner would have no incentive to practice "hard shooting," producing thereby an excessive amount of dirty screenings. On the contrary, his interests would be in line with those of the operator, in producing larger quantities of lump coal, and, as a result, greater harmony would prevail.

S. F. Rock,
Civil and Mining Engineer.
Richmond, Ky.

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The Certificate Law

Letter No. 18—It has been with great interest that I have read the different opinions expressed in relation to the interchange of certificates issued by the mining departments and examining boards of different coal-producing states and provinces. Being the holder of three first-class certificates issued, respectively, in Pennsylvania, Alberta and British Columbia, Canada, my experience may be of interest to others.

I strongly favor the adoption of a plan that would bring about an interchange of certificates of competency for the positions of mine manager, mine foreman, fireboss and hoisting engineer, in all states and provinces where the conditions of mining are similar. Such a plan would, however, require a uniform standard of examination. Without such a uniform standard and the limitation to similar conditions in mining, such an interchange of certificates would not be advisable. In my opinion, it would not operate in the interest of safety for the men and the security of mining property.

To make my meaning clear, I would say it would not be policy for an examining board to grant a certificate of competency to a mine foreman, for a gaseous mine, when his present certificate entitles him to hold that position in a nongaseous mine only. The same difference of condition should be considered in respect to dust. While one mine may be practically free from dust, or contain dust that is almost inert, the dust of another mine may be highly inflammable and explosive.

Again, assuming like conditions of mining and an equal standard of examination, the practical experience of the candidate should be a large factor in determining his qualification to take charge of a mine. I believe that a man of long experience who has duly qualified and obtained his certificate in one state, is better fitted to hold the same position in another state than the man who has succeeded in passing the examination in that state, but who has only the amount of experience required by law to enable him to secure a certificate. The man of large

experience is a more valuable man and will be able to operate the mine with greater safety and advance the interests of the company more certainly than the man who has yet much to learn.

In regard to the life of certificates of competency, I am of the opinion that all officials in coal mining should be examined at least every five years, up to the age of 50 years, when I think they should be exempt from further examination. I believe that such periodical examination would be a great stimulus to efficiency; as mine managers, mine foremen and firebosses would then have to keep posted in reference to mining matters, as the examinations would naturally keep pace with the improvements made each year in coal mining. In my opinion, periodical examinations should be strongly advocated by all mining corporations, as it would provide more intelligent and efficient service and increase the safety of the men and security of the mines.

J. W. POWELL, Supt.,
Cottonwood Coal Co.

Windham, Mont.

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Letter No. 19—In connection with the discussion of the certificate law, I would like to draw attention to a common practice in mines that is very annoying to a conscientious fireboss and one that cannot but prove harmful and even dangerous in many cases. By drawing attention to this practice, which is more or less prevalent in all mining districts, it may be possible to obtain some remedial legislation that would go far toward eliminating the evil.

I refer to the fact that a fireboss who is thoroughly qualified and competent to discharge the duties of his office, and aims to fulfil the requirements of the mining law of the state impartially in the performance of his duties, and is governed by a single motive only, namely, to insure the safety of the men and the security of the property in his charge, may and often is intimidated and forced to make a report that is, to say the least, inconsistent with his knowledge and convictions.

Too often it happens that the fireboss is approached by a mine committee, whose conduct is influenced and regulated most largely by the careless, indolent and meddlesome element in the mine. It is this class of workers that breed trouble and do more to endanger the lives of their fellow workers than any other condition common to mining.

The consideration of these facts, which are well known to all familiar with mining conditions, must convince any unprejudiced mind that we have need of the enactment of a law making it a penal offense for any man or committee of men to interfere with the fireboss in the performance of his duties in the mine.

A CONSTANT READER.
Caldwell, Ohio.

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Letter No. 20—In my opinion, the mine foreman is the most logical man to determine the nature of the dangers present underground. For this reason, he should have the knowledge and practical experience that will enable him to foresee dangers that may arise and detect any dangerous conditions that may already exist in the workings. On the mine foreman rests the responsibility of thus detecting and removing all dangers reported or known to exist in the workings.

A conscientious foreman, having at heart the "safety first" idea, will not fail to visit every portion of the mine as often as his duties and time will permit. The feeling of his responsibility will take him to the working face, into the gob and all abandoned places, and cause him to travel constantly the airways, haulage roads and traveling ways throughout the mine. Therefore, if anyone knows the true condition of the mine, it is the foreman. His knowledge and acquaintance with underground conditions are more intimate than that of the superintendent, the general manager, or even the mine inspector.

Referring to the work performed by the state mine inspector, his time is too limited for him to secure more than a general knowledge of each mine visited. He inspects No. 1 mine today, No. 2 tomorrow; and his time, for the next 60 or 90 days, is spent in other fields. On his return, he goes hurriedly through the mine, makes certain suggestions and notes the general conditions for the report he must make to his chief. It is absurd to think that the mine inspector with his many and varied duties, in connection with the special investigation of accidents, attendance upon coroners' inquests and the compilation of reports, can possess a knowledge of any particular mine equal to that of the mine foreman.

Because the mine foreman, of all other persons, is the man in closest and constant touch with the mine workings

and the conditions existing therein, he should not only be a good moral and truthful person, but he should have the very best training possible to fit him to assume the duties and responsibilities of his position. He should be a man of sunny disposition that will enable him to gain and hold the good-will and respect of every man in his charge, as well as that of his superiors.

In view of these responsibilities, a mine foreman should never be allowed to take charge of a mine until he has become fully acquainted with the conditions existing within and around that mine. No argument is needed to prove that a man capable of assuming these responsibilities will have little or no trouble in passing an examination in any state in which he may seek employment. In my opinion, any man, with ambition to pass an examination for a certificate of competency, if he is a true man, will keep himself posted on mining matters sufficiently to enable him to pass an examination in any state, as that is his reasonable duty that he owes his fellow workers and the company who employs him. For my own part, I have never seen the time yet when I could not study and read. I am convinced that it is best for all concerned that each state examine its own foremen and firebosses.

A. H. STANSBERRY.

Oliver Springs, Tenn.

Study Course in Coal Mining

BY J. T. BEARD

The Coal Age Pocket Book

Potential Values of Different Airways—In order to show the resisting power of airways of different lengths of those sizes in more common use, the following table has been prepared, showing the potential value of each airway, as calculated by the formula

$$\text{Potential of airway } X = \frac{a}{\sqrt[3]{klo}}$$

Following this is another table giving the potential values of different circulations, by which is meant the circulation of different volumes of air under different pressures or water gages. A comparison of the potential values in these two tables will serve to show what circulation can be obtained in airways of given size and length when properly arranged and unobstructed.

TABLE—POTENTIAL VALUES FOR DIFFERENT AIRWAYS

| Size of Airway | 1000 | Length of Airway (ft.) | | | | | Potential Value of Airway |
|----------------|-------|------------------------|-------|-------|-------|--------|---------------------------|
| | | 2000 | 3000 | 5000 | 8000 | 10,000 | |
| 4x10 ft..... | 485.3 | 385.0 | 336.5 | 283.8 | 242.6 | 225.2 | |
| 4x12 ft..... | 557.0 | 441.9 | 386.2 | 325.7 | 278.5 | 258.5 | |
| 4x14 ft..... | 624.8 | 495.7 | 433.2 | 365.4 | 312.4 | 290.0 | |
| 5x8 ft..... | 497.4 | 394.6 | 344.9 | 290.9 | 248.7 | 230.9 | |
| 5x10 ft..... | 592.8 | 470.3 | 411.0 | 346.7 | 296.4 | 275.2 | |
| 6x8 ft..... | 582.3 | 462.0 | 403.8 | 340.6 | 291.2 | 270.3 | |
| 6x10 ft..... | 696.2 | 552.4 | 482.7 | 407.2 | 348.1 | 323.2 | |
| 7x8 ft..... | 664.0 | 526.7 | 460.4 | 388.3 | 332.0 | 308.2 | |
| 7x10 ft..... | 796.0 | 631.5 | 552.0 | 465.5 | 398.0 | 369.5 | |
| 8x10 ft..... | 892.6 | 708.1 | 618.9 | 522.0 | 446.3 | 414.3 | |

Potential Values of Different Circulations—The circulation of a given quantity of air in a certain airway or mine requires a certain pressure or water gage, which determines the "potential of the circulation."

In the following table, the potential of the circulation is calculated by the formula

$$\text{Potential of circulation, } X = \sqrt[3]{\frac{Q^2}{p}} = \sqrt[3]{\frac{Q^2}{5.2 w.g.}}$$

TABLE—POTENTIAL VALUES FOR DIFFERENT CIRCULATIONS

| Water Pressure Gage (In. sq.ft.) | Volume of Air Circulated (cu.ft. per min.) | Potential Value of Circulation |
|----------------------------------|--|--------------------------------|
| 6..... | 31.2 | 147.4 |
| 5..... | 26.0 | 156.7 |
| 4..... | 20.8 | 168.8 |
| 3..... | 15.6 | 185.8 |
| 2 1/2..... | 13.0 | 197.4 |
| 2..... | 10.4 | 212.6 |
| 1 1/2..... | 7.8 | 234.0 |
| 1..... | 5.2 | 267.9 |
| 1/2..... | 2.6 | 337.6 |
| | | 442.3 |
| | | 621.8 |
| | | 987.0 |
| | | 1293.4 |
| | | 1566.8 |

The Coal Age Pocket Book

A comparison of the two tables on the preceding page shows that to pass a current of 25,000 cu.ft. per min. through an airway of 5x8 ft., 3000 ft. long, including the return will require, practically, a 3-in. water gage. This is ascertained by observing that the potential value of an airway 5x8 ft., 3000 ft. long, as given in the first table, is, say 346. Then find the water gage corresponding as nearly as possible to this value, in the second table, in the vertical column for 25,000 cu.ft. per min. The potential of the circulation of this air volume under a 3-in. gage is, say 342, showing that a 3-in. gage is a little in excess of what is required to circulate 25,000 cu.ft. of air per minute in a 5x8-ft. airway, 3000 ft. long, including the return.

Effect of Splitting on Mine Potential—As a mine is developed and its airways extended, it becomes impracticable to carry the air in a single current throughout the entire length of the airways, as the water gage then increases directly as the length or distance of air travel. To avoid this difficulty, the air must be divided or "split" one or more times; so that there will be two or more separate currents in the mine. Each of these currents is called a "split of air," or simply a "split."

It should be observed that dividing the current does not change the total rubbing surface(s) in the mine; but the area of passage (a) is increased in proportion to the number of splits or currents. Since $s = lo$, the formula for potential of airway may be written as mine potential; thus,

$$\text{Mine potential, } X = \frac{a}{\sqrt[3]{k s}}$$

Since the rubbing surface (s) and the coefficient (k) are constant and the area (a) increases in proportion to the number of splits or currents, the potential (X) increases in the same proportion. Therefore, any of the airway potentials of the first table can be multiplied 2, 3, 4, etc. times according to the number of splits or currents employed.

For illustration, suppose the airways of a mine are 5x10 ft. and have a total length, including return, say 10,000 ft.; and the required circulation is 100,000 cu.ft. per min. The velocity of the air should not exceed, say 500 ft. per min., in the airways. This will require a total area of passage of $100,000 \div 500 = 200$ sq.ft. But the sectional area of these airways is $5 \times 10 = 50$ sq.ft.; and there must, therefore, be $200 \div 50 = 4$ splits or currents to comply with the conditions named. The potential value, as given in the table, for a single current, is, say 275; and the mine potential for four splits is, therefore, $4 \times 275 = 1100$. By referring, now, to the second table giving the values of the potential of circulation, it is found that a potential value of 1100, in the circulation of 100,000 cu.ft. per min. shows a water gage between 1 and $1\frac{1}{2}$ in. The true value may be found by interpolation, if desired, and is 1.46 in.

The potential value of any desired circulation of air, as compared with the potential value or "potential factor" of the proposed mine or airway is thus seen to have an important practical value that commends it to all students of mining.

Inquiries of General Interest

Flow of Water in a Vertical Pipe

The accompanying sketch is intended to represent an accumulation of water in an overlying abandoned seam; and it is desired to know how many gallons of water per minute will flow down a 10-in. pipe, into an underlying seam, assuming the pipe is vertical and its mouth 80 ft. below the surface of the water in the upper seam.

DRAINAGE.

Seanor, Penn.

In this case, the gravity head, 80 ft., is opposed by three heads; namely, the entrance head (h_o) required for the water to enter the pipe and due directly to the crowding of the stream lines, as illustrated in the accompanying figure. Beside the entering head, there is the friction head (h_f) due to the resistance of the pipe to the flow of the water, and the velocity head (h_v) absorbed in producing the velocity of the water in the pipe.

The velocity head and the friction head have been fully explained, COAL AGE, Vol. 3, pp. 541 and 970. Experiments have shown that if the mouth of the pipe is flush with the floor of the seam, there being no bell-shaped entrance, the entrance head is practically one-half of the velocity head. Therefore, these three heads are expressed as follows:

$$\text{Entrance head, } h_o = 0.0013 \frac{G^2}{d^4}$$

$$\text{Velocity head, } h_v = 0.0026 \frac{G^2}{d^4}$$

$$\text{Friction head, } h_f = \frac{l G^2}{800 d^5}$$

The sum (h) of these three heads may therefore be written

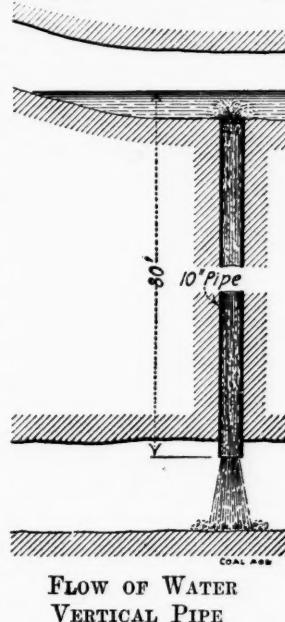
$$h = \left(0.0039 + \frac{l}{800 d} \right) \frac{G^2}{d^4}$$

which may be written

$$h = \frac{1}{800} (3.12 d + l) \frac{G^2}{d^5}$$

From the last equation, calculating the flow of water, in gallons per minute (G), through a pipe whose diameter is d , we have

$$G = 20 d^2 \sqrt{\frac{2 d h}{3.12 d + l}}$$



Substituting the values, $h = 80$ ft., $l = 80$ ft. and $d = 10$ in., we have for the flow of water, under the assumed conditions,

$$G = 20 \times 10^2 \sqrt{\frac{2 \times 10 \times 80}{3.12 \times 10 + 80}} = \text{say } 7500 \text{ gal per min.}$$

Study Question--Timbering

I have been studying some of the back numbers of COAL AGE, and would like to ask for an explanation of the factor, $4/3$, contained in the answer to the first question on p. 268, Vol. 2. The question is as follows:

"What load will break a white-pine beam 10x12 in. and 14 ft. clear span? Assume the beam is supported at both ends and uniformly loaded."

The answer gives the following calculation:

$$\frac{4}{3} \times 7500 \frac{10 \times 12^2}{14 \times 12} = 85,700 \text{ lb.}$$

I do not understand the factor $4/3$, and cannot find any table that gives the fiber stress as 7500 lb. per square inch, as stated in the answer to this question. Instead, I find it given as 450 lb., on p. 103 of the Coal and Metal Miners' Pocket Book. The formula I have always used does not give much more than one-half the above load.

$$\text{Breaking load } \frac{10 \times 12^2}{14} \times 450 = 46,300 \text{ lb.}$$

Kindly explain my difficulty.

"X."

Seanor, Penn.

In the first place, the rule quoted by correspondent gives the breaking load, in pounds, for a rectangular beam "loaded at the center," and the question states the beam is "uniformly loaded." For a uniform load the result must be doubled, which gives, by correspondent's method, 92,600 lb.

The formula given in COAL AGE, Vol. 2, p. 268, is a more accurate formula for determining the breaking load of a rectangular beam uniformly loaded. This formula is based on the fiber stress of the material, which, for white pine, is 7500 lb. per sq.in. This is an average value for a good quality of white pine, based on the reports of the U. S. Agricultural Department, Division of Forestry.

The factor, $4/3$, has been determined, by experiment, for rectangular beams supported at each end and uniformly loaded. The two formulas will be seen to practically agree, remembering that the length of span in correspondent's formula is given in feet, while in the COAL AGE formula it is given in inches. Thus, comparing these two formulas, we have

$$\frac{4}{3} \times \frac{7500}{12} = 833$$

This is somewhat less than $2 \times 450 = 900$, which would be the value used by correspondent, corrected for a uniform load. The difference in these results lies in the value taken for the fiber stress.

Examination Questions

Miscellaneous Questions

(Answered by Request)

Ques.—What are the duties of a mine foreman?

Ans.—Upon the mine foreman devolves the duty of seeing that the mining law is carried out in every particular. It is his duty to be thoroughly familiar with the state law in all its details and to see that the mine is operated in compliance thereto. The mine foreman must devote his entire time to the supervision of the mine. He must direct all operations underground; keep watch over the ventilation of the mine; inspect all machinery and appliances used in ventilating, pumping, hoisting and haulage and the means used for lighting and draining the mine. He must inspect all working places, haulage roads, air courses and traveling ways as frequently as practicable, and where his duties and limited time will not permit of a daily inspection of every part of the mine, he must see that this is properly done by competent assistants.

The mine foreman must make regular measurements of the air traveling in the mine and record the results of these measurements in a book kept for that purpose. He must superintend all work, see that it is performed in a proper and workmanlike manner; make suitable regulations for safety; and maintain discipline. Besides supervising the daily output of the mine, he must report all accidents to the mine inspector, attend all coroners' inquests and do all in his power to maintain safe conditions in and around the mine.

Ques.—What weight of coal dust does it take to cause an explosion?

Ans.—This question cannot be answered definitely, inasmuch as the explosive condition, with respect to fine coal dust in suspension in the air, will depend on a number of conditions, such as, the fineness and inflammability of the dust; the gaseous condition of the mine air, its temperature and hygrometric state; and the presence or absence of other gases that would increase or decrease the explosiveness of the mixture.

Theoretically, it is estimated that 1 lb. of finely divided coal dust, held in suspension in the air, in the absence of other gases than that produced by the burning of the dust, will render explosive 2440 cu.ft. of air measured at a normal temperature and pressure. This corresponds to practically 0.006 oz. of coal dust per cu.ft. of air.

Ques.—Assuming that an air current containing gas at its most explosive point, has a velocity of 400 ft. per min. in a 6x8-ft. airway; how much air must be added to this current to make the gas it contains 1 per cent. of the mixture?

Ans.—The sectional area of the airway is $6 \times 8 = 48$ sq.ft. The volume of air in circulation is, then, $400 \times 48 = 19,200$ cu.ft. per min. The air current being at its most explosive point contains 9.46 per cent. of gas. The volume of gas in the current is, therefore, $19,200 \times 0.0946 = 1816.32$ cu.ft. If this volume of gas is 1 per cent., the total volume of the mixture of gas and air will

be $1816.32 \div 0.01 = 181,632$ cu.ft. per min. The volume of air that must be added, therefore, is $181,632 - 19,200 = 162,432$ cu.ft. per min.

Ques.—A colliery shaft 16 ft. in diameter and 250 fathoms deep is used entirely for the purposes of ventilation. Taking the coefficient of friction as 0.005, calculate the entire frictional resistance of the shaft and the horsepower expended when an air current of 250,000 cu.ft. per min. is passing.

Ans.—The sectional area of the shaft is $0.7854 \times 16^2 =$ say 201 sq.ft. The velocity of the air current is $250,000 \div 201 =$ say 1250 ft. per min. There being 6 ft. in one fathom, the depth of the shaft is $250 \times 6 = 1500$ ft. The perimeter of the shaft is $3.1416 \times 16 = 50.266$ ft., nearly. The rubbing surface of the shaft is, therefore, $s = 50.266 \times 1500 =$ say 75,400 sq.ft. Since the value of the coefficient of friction given is probably per thousand cubic feet of air, the velocity must be expressed in thousands of feet per minute; and is, in this case, $1250 \div 1000 = 1.25$ thousand feet per min. The resistance of the shaft is then

$$R = ks v^2 = 0.005 \times 75,400 \times 1.25^2 = 589 + \text{lb.}$$

To find the horsepower absorbed in passing the air through the shaft, this resistance must be multiplied by the velocity of the current, and that product, divided by 33,000; thus

$$H = \frac{589 \times 1250}{33,000} = 22.3 \text{ hp.}$$

Ques.—In a mine working 312 miners, 49 daymen and 22 mules, how many cubic feet of air should be in circulation when 80 per cent. of the miners are at work in the mine?

Ans.—The total number of men at work is $0.80 (312 + 49) =$ say 290 men. Assuming a nongaseous mine and allowing 100 cu.ft. of air per min. per man, and 500 cu.ft. per min. per mule, the total quantity of air in circulation should be $290 \times 100 + 22 \times 500 = 40,000$ cu.ft. per min.

Ques.—What material would you consider the best to use for building an overcast in a mine that is producing marsh gas in dangerous quantities; stone, brick, iron or wood? Give reasons.

Ans.—Although stone, brick and iron are often used for this purpose, wood is generally preferred, for the reason that a wooden overcast is more easily repaired when broken or displaced by the force of an explosion than one built of stone, brick or iron. The destruction of a brick or stone overcast will generally result in a heap of rubbish, while the twisted iron, in that type of construction, is always difficult of removal. On the other hand, the broken timbers of a wooden overcast can be quickly cut or sawed out and removed. In many cases, however, the wooden planks and timbers are not broken but merely displaced, and the air bridge can be quickly repaired. The principal objection to the use of wood for building an overcast is that the wood is combustible and therefore an element of danger.

Coal and Coke News

Washington, D. C.

The demand for active Government participation in the operation of mines still continues. The sub-committee of the House Committee on Mines which was authorized to investigate the Colorado coal strike has already gone to the field of action and is engaged there in beginning its work.

Meantime the Industrial Relations Commission which has apparently felt the necessity of undertaking something in line with the demands that have been made by Congress has also, it is understood, voted to start upon an inquiry into the mining conditions.

In order to push these efforts further, Senator Borah in a long speech delivered in the Senate on Feb. 4 made an elaborate attack upon the methods adopted by the State of West Virginia for the purpose of repressing the disorders in the coal mining regions.

Incidentally he said that the vast majority of coal mine workers favored peaceful methods in urging their purposes and that labor leaders who preached lawlessness were enemies to the man who toils and to the cause of better conditions, better pay and happier homes. He contended, however, that all guarantees of constitutional government must absolutely be insisted upon in the case of labor troubles just as in every other case where there was conflict between two elements in the community.

Rate Hearings Concluded by Shippers

Bituminous coal men have finished their case against the proposed increase of rates suggested by the railroads, occupying the bulk of Monday, Tuesday and Wednesday, Feb. 2, 3 and 4 in their argument. It is understood, however, that they will be permitted to add further data in reply to the carriers if it should be found that the latter have presented fresh information that is of a nature calling for additional data.

Among those who have testified most effectively during the latter part of the hearings for the bituminous coal shippers was H. H. McCue of the Pittsburgh Coal Co. who argued that the results of the Boileau case would be entirely neutralized and a much greater harm inflicted on the shippers if the proposed rate increase were permitted. The Canadian Manufacturers Association has also protested on the ground that the proposed advance would certainly be followed by a similar advance over Canadian lines.

HARRISBURG, PENN.

One of the many problems that have arisen in connection with the workings of the income-tax law, and one that vitally interests many people of the anthracite and bituminous regions of this state, is that which is involved in determining whether coal royalties are to be considered as income, or as the proceeds of a sale. The contention is made by holders of the fee that since when the coal is exhausted, the property no longer exists, the royalties should rightly be considered converted capital assets and not income.

The following opinion has been given from the office of the Commissioner of Internal Revenues at Washington, D. C.

This office holds, that under the provisions of the income-tax law, Section 2, Act of Oct. 3, 1913, royalties, in a measure represent income to the individual receiving the same and must be so returned; but the owner of the fee from which the coal or ore is received may deduct from the income, to make good the depletion of assets, an amount not to exceed 5 per cent. of the gross value of the output at the mine, that is, the f.o.b. value at the mine.

What proportional amount received from royalties which represent gains and profits and what amount can be considered conversion of capital assets is not, as yet, finally determined, and until a definite rule is adopted relative to this matter, royalties will be considered an income and return will be made in accordance with the above suggestions.

A prominent attorney, who has taken this matter up with the Federal department in the interest of clients who have royalty bearing coal holdings, explains how this rule would work out, by the following example: If the gross value of the output at the mine is \$3.80 per ton, which is a fair rating, then the discount allowed for depletion of assets would be 5 per cent. of that amount, or 19c. for each ton. If the owner of the fee held interests which netted him 30c. on each ton, then 19c. would represent the amount on each ton allowed for depletion, and would be regarded as the converted capital

assets. The balance, 11c., would be considered income. If the output for the taxation period was 10,000 tons, then the individual's royalties would be \$3000, of which \$1100 would be regarded as income and \$1900 as converted capital assets.

The Pennsylvania Files an Answer

The answer of the Pennsylvania R.R. Co. to the complaint of the Manufacturers' Association, of Lancaster, regarding the rate for the transportation of bituminous coal from the Clearfield district to Lancaster was filed recently with the Public Service Commission. The Baltimore & Ohio and the Philadelphia & Reading have also filed petitions for leave to intervene, as party defendants.

The coal-shipment-rate question has been before the commission for some time and expert advice has been called in on the question of rates from the Schuylkill region (anthracite) to Philadelphia. A report will soon be made.

In its answer regarding the rates charged for moving bituminous coal to Lancaster, the Pennsylvania R.R. denies that the rate is unjustly discriminatory against Lancaster, and asks that the complaint be dismissed.

The Baltimore & Ohio says that if the rates of the Pennsylvania R.R. are reduced it will be necessary for the Baltimore & Ohio either to reduce its competitive rates from the Meyersdale or Somerset region to Lancaster; or, if it maintains its present rates, to allow its shippers to be placed at a disadvantage in competition with shippers from the Clearfield region on the Pennsylvania R.R.

The Reading likewise asserts that if the Pennsylvania R.R. is compelled to make a reduction the Reading would be compelled either to maintain its present rate and thus lose a great part or all of its traffic in bituminous coal to Lancaster, or to reduce its rate to Lancaster and to the numerous intermediate points which are embraced in the rate group.

A reduction in rates to all such intermediate points would greatly decrease the revenues of the Reading and would result in a far-reaching disturbance of its rates to eastern Pennsylvania points.

PENNSYLVANIA

Anthracite

Shamokin—All collieries of the Susquehanna Coal Co. in this region closed down Feb. 4 until Feb. 9, 5000 employees being rendered idle. Mild weather and a slump in the anthracite coal trade is given as the reason for the order.

Fire, which broke out in No. 16 vein of the Buck Ridge colliery, on Feb. 2, spread with considerable fury with the result that it was necessary to flood the workings. It is supposed that the fire resulted from defective dynamite. Over 100 miners were laid off for an indefinite length of time.

Wilkes-Barre—The court of Luzerne County, on Feb. 4, appointed the following to serve on the board of mine inspectors' examiners for Luzerne and Carbon Counties: George P. Gallagher, of West Pittston, and Charles S. Miles, of Wilkes-Barre, mining engineers; Benjamin McEneenay, of Exeter, Thomas J. Evans, of Nanticoke, and Patrick Dougherty, of Lansford, practical miners. The men succeeded are John W. Berry, Robert A. Quinn (vice-president of Susquehanna Coal Co.), mining engineers; George L. Walker, Plains, William Toner, of Larkeville, and Frank Schmear, of Lansford, miners.

Pottsville—An explosion of dynamite killed two men on Feb. 2, in the stripping of the St. Clair Coal Co., and was caused by a charge of dynamite left unexploded from Jan. 30, with which a drill came in contact when a laborer drilled into the hole unaware of the presence of the explosive. Mine Contractor Frank Denning and an unidentified Italian were killed instantly.

Bituminous

Outcrop—Alleging that John Heron, mine foreman of the Crystal mines of the United Connellsburg Coke Co., had permitted Frank Fordyce to fire a blast from "solid" while other employees were in the immediate vicinity, Mine Inspector I. G. Roby recently made information against Heron charging him with violation of the mining laws.

New Bethlehem—Frank Williams & Co. have leased their upper Hillville mine at New Bethlehem in the Allegheny

Valley to A. W. Williams, of Pittsburgh. It has been idle some months, but will start up at once. It has a capacity of 400 tons, but will be pushed up to 600 tons soon.

Connellsville—It is reported the H. C. Frick Coke Co. is negotiating for the purchase from J. V. Thompson, of Uniontown, of 7000 to 10,000 acres of coal in Greene County at \$500 to \$800 an acre, the deal involving approximately \$5,000,000.

Pittsburgh—Shipments of coke from the Connellsville region over the Pennsylvania lines to Pittsburgh and West were lighter in January than in the same month last year. Official figures show that 29,244 cars of coke were shipped in the initial month of 1914, while during the same period of 1913 the shipments aggregated 49,472 cars. This is a decrease for the present month of more than 20,000.

WEST VIRGINIA

Charleston—The coal business in West Virginia appears to be, at the present time, more slack than for years. Mines in the Clarksburg-Fairmont region are working but a small portion of the time, while some of the smaller concerns have closed down temporarily.

Kingwood—The Kingwood-Cleveland Coal Co., a corporation with main offices in Cleveland, Ohio, has recently purchased a large tract of coal land at Snyders' Crossing, where a siding is now being constructed from the main line of the West Virginia Northern to the company's holdings. Tipples and power houses will be erected in the near future as well as dwellings, it is believed. It is the expectation to be producing coal in large quantities at an early date.

Colliers—Officials of Brooke County are seeking some plan whereby they may disarm striking coal miners who are known to carry weapons, but are being careful to remain on their own property and are hence not amenable to the state law prohibiting the carrying of fire arms.

VIRGINIA

Virginia City—The mines of the Virginia City Colliery Co. were recently sold to George W. Lambert and W. T. Williams, and it is understood that the new owners will spend considerable money electrifying and otherwise improving the property so as to double its present output of coal.

ALABAMA

Oakman—The Atlas Coal Co. recently leased its mines near Oakman to J. C. Lilick, of Ensley, and Joseph Thompson, of Adamsville. Messrs. Lilick and Thompson are experienced and practical mining men.

KENTUCKY

Sebree—About 30 employees of the Sebree Coal & Fuel Co. have gone on strike on account of the refusal of the company to pay every Saturday night, instead of on alternate Saturdays, as the rule has been for a number of years. The mine is idle.

Henderson—Negotiations are under way by the Deep Water Coal & Coke Co. for a site on which a modern steel tipple and complete loading equipment for the company's barges will be erected. It is understood, however, that nothing definite has yet been determined with reference to the location of the site, as some difficulty is being experienced in securing land at a reasonable figure.

Dawson Springs—It is reported that Claud Gentry will open up a small operation near here to work a 58-in. vein of No. 6 coal which he has discovered.

Providence—The Harris Coal Co. has filed a voluntary petition in bankruptcy in the Federal court at Owensboro, Ky. Liabilities are fixed at \$16,859, while assets are said to amount to \$13,645. The Madisonville Savings Bank is the largest creditor of the company.

OHIO

Bridgeport—The 450 miners employed in the Wheeling Creek mine of the Lorain Coal & Dock Co. who have been idle since the explosion which killed Frank Hora have agreed to resume work. The order from the State Mining Department that only oil should be used for lighting purposes caused the men to go on strike. Their contention is that it was coal gas and not acetylene which caused the explosion.

Columbus—The pamphlet to be issued by J. M. Roan, safety superintendent of Ohio mines, to start the campaign of "safety first" will be published in seven different languages in order to reach all of the miners of the Buckeye state. Mr. Roan will write a personal letter to every miner injured, advising him of the way to prevent such accidents in the future.

East Liverpool—Eighty miners employed by the Card & Prosser Co., of West Pittsburg, walked out of the mine at that place recently because of a reduction in the wages for dead work. Steps are being taken to adjust the difficulties.

Cannelville—The announcement is made that mine No. 38 of the Maynard Coal Co. will be closed permanently, but this is denied by the company officers located at Columbus. The mine is to close temporarily because of lack of orders.

INDIANA

Petersburg—Nearly 1000 acres have been leased in Pike and Warren counties for surface coal mining. The veins are 3 to 7 ft. thick lying at a depth of 5 to 40 ft. It is estimated surface coal is available in 6000 acres in the two counties.

Sullivan—Clifford Botts, a machine operator at the Reliance mine, was recently fined \$10 and costs for failing to provide break throughs in rooms and entries at a distance of at least every 45 ft., and Sam Watts, mine boss, was fined \$10 and costs for failing to properly ventilate the mine.

Clinton—It is confidently predicted by officials of the Bunsen Coal Co. that provided there is no cessation of work in April, due to the wage-scale agreement, that one million tons of coal will be produced from the two Bunsen mines known as the "million-dollar twins," located five miles south of this city. Although expensively equipped, these mines have not thus far equaled in output some of the other coal mines in the Clinton field.

ILLINOIS

Marion—W. L. Dunsten and Hogan Williford have purchased the mine east of here known as the Pittsburg Big Muddy. It is not likely they will operate this property unless they can get a connection with the Iron Mountain R.R. Its present connection is on the Illinois Central.

Irving—The Peabody Coal Co. is having some trouble with its mine at Taylor Springs. About a year ago a fall closed up one of the main entrances, shutting off a considerable amount of equipment, and damaging the farm of E. T. Richards. Recently another squeeze occurred, this time in the third and fourth entries and men have been warned to keep out of this portion of the workings.

Chicago—Swift & Co. and three railroads were recently indicted by a grand jury in the U. S. District Court on charges of rebating and soliciting rebates. The packing firm alone faces a possible maximum fine of \$1,200,000 under the charges. The other defendants were the Pennsylvania R.R., the Chicago & Northwestern R.R., and the "Panhandle."

IOWA

Knoxville—Workmen employed in digging a deep well on the Inebriate Hospital grounds report that the drill penetrated an 8-ft. vein of good coal at a depth of 290 ft. It is said that a shaft will be sunk and the deposit worked by the hospital inmates before the end of the present year.

MISSOURI

Moberly—In an accident recently at the Elliott mine, five miles south of this place, electrician, Barman was instantly killed and two assistants seriously injured while repairing the ropes of the cage. One of the ropes broke, permitting the cage to drop to the bottom of the mine.

KANSAS

Courtland—A report that a 6-ft. bed of coal has been discovered near Courtland, brought a number of operators to the scene. If the veins prove as rich as expected, active operations will begin shortly.

Beulah—George & Lawler have secured 3500 acres of coal land, north of Beulah, and have begun prospecting. This is a comparatively new territory, but is believed to be rich in coal. They have leased also 1800 acres south of the tract referred to, to the Hamilton Coal & Mercantile Co., which is conducting experiments with a view of beginning operations in the near future.

ARKANSAS

Fort Smith—The strike of miners in the employ of the Central Coal & Coke Co. was terminated shortly after the walkout. About 1000 men were out, affecting eight mines. The miners charged that the company failed to abide by the decision of the district arbitrator, who upheld the claims of four men for compensation during a period of alleged enforced idleness. The company ultimately agreed to pay the claim and the miners returned to work.

Suit to annul the lease of the Pennsylvania Mining Co. on 100 acres of coal land in Johnson County has been filed by

J. T. Bailey and Van R. Norris in the United States court. The plaintiffs allege the company has failed to pay royalties of 10c. a ton on coal mined since 1911, and that the corporation has ceased using the land except to extract coal from adjoining territory. Both charges, the petition asserts, automatically annul the lease.

OKLAHOMA

Bartlesville—A. M. Parsons has secured a number of leases on coal land near Bartlesville, Okla., and will begin testing at once. The contracts provide that thorough tests must be made within six months, and that operating must begin within a year from the date of the leases.

COLORADO

Pueblo—It is reported upon military authority that but for the congressional investigation, the militia could be removed from the southern coal fields at once. It is alleged that about one-third of the original number of strikers are left in the tent colonies, and these are said to be leaderless and without heart. They have been urged on by false hopes and now the congressional investigation is holding those that remain together.

Colorado Springs—It is believed that Colorado Springs will be one of the cities in this state where the federal committee to investigate the coal strike will hold hearings. This belief is based upon advices received from Washington.

RECENT COAL AND COKE PATENTS

Improvements in Coal Conveyors. L. Hyve, of Dourges, near Douai, Nord, France, 4700 of 1913.

Coal Jigger. C. Simon, Essen-on-the-Ruhr, Germany, 1,082,102, Dec. 23, 1913. Filed Sept. 4, 1912. Serial No. 718,550.

Improvements in and Relating to Coal Washing Plants. R. Thomson, Lilybank, Reid St.; Burbank, Hamilton, Scotland. 4451 of 1913.

Mining Machine. A. H. Gibson, assignor to Ingersoll-Rand Co., New York, 1,082,318, Dec. 23, 1913. Filed Nov. 18, 1908. Serial No. 463,211.

Improvements in Apparatus for Washing Coal and Other Minerals. W. Habets, Montegnee, Belgium, and A. France, Rue de l'Esperance, 223, Liege, Belgium. 17,012 of 1913.

A New or Improved Method of and Means for Screening or Grading and Conveying Coal, Coke and Other Material. R. Benson, Riverside, Middleton, St. George, Durham, and Head Wrightson & Co., Ltd., 28,115 of 1912.

PERSONALS

R. F. Rogers, formerly of the Rogers-Garlick Coal Co., has been appointed assistant general manager of the Blue Ash Coal Co.

J. W. Dean, formerly mine foreman of the Barker Nos. 2 and 3 mines of the Continental Coal Corporation, has been appointed mine inspector over the 15 mines of the same company. His special work will be looking toward further safety of the company's employees.

O. P. Gothlin, who has been connected with the Ohio Public Service Commission since its formation has resigned his position as head of the traffic bureau and will travel in Florida for a time. Later he may be connected with the Interstate Commerce Commission. Mr. Gothlin is recognized as a traffic expert.

H. D. Mason, Jr., in charge of the United States mine-rescue car No. 4, now at Pittsburg, Kan., recently submitted a report showing the results of the recent tour of Arkansas and Oklahoma, which was interrupted by the Dawson disaster. One hundred and sixty-six men took the full rescue course, according to the report, while 36 more took partial courses. Nearly 4000 persons visited the car on the tour.

F. J. Durden has been appointed general sales agent of the B. S. Hammill Fuel Co., and is opening offices in the new Marine Bank Building. He was a former Buffalo coal man, but was for some years general sales agent of the Monongahela River Consolidated Coal & Coke Co., previous to the consolidation with the Pittsburgh Coal Co.

OBITUARY

John H. Jones, general coal freight agent of the Philadelphia & Reading Ry. Co., died at his home, 356 Church Lane, Germantown, Philadelphia, on Feb. 4, from heart disease. Mr. Jones was born Jan. 26, 1837, in Norristown, Penn. In 1861 he enlisted in the 1st regiment of Pennsylvania Volunteers and served until April, 1865, on the staff of General O. O. Howard. He entered railroad service in 1865, and in 1880 was appointed general coal freight agent of the Philadelphia & Reading Ry. In 1890 he was made special agent in charge of the United States Census for the Department of Mines and Mining.

CONSTRUCTION NEWS

Charleston, W. Va.—Extensive coal development will be undertaken by the Lackawanna Coal & Lumber Co. on a 30,000-acre tract of land in Boone County, West Virginia, early in the summer. It is proposed to develop a model town to be called Griffith.

Rockwood, Penn.—The Bradenburg Coal Co. has closed down its mine east of Rockwood, due to slackness of orders. The State Line Coal Co. has also laid off many of its miners until about Apr. 1. In the meantime, needed repairs will be made to the plant and several mining machines will be installed.

Columbus, Ohio.—According to an announcement of the Ohio Public Utilities Commission steps will be taken soon to secure new equipment for the Detroit, Toledo & Ironton R.R. The shippers along that route have been hampered by lack of equipment and motive power as the road is in the hands of a receiver. Steps are being taken to refinance the road.

Columbus, Ohio.—The announcement is made that the Norfolk & Western R.R. Co. will build a third track from Portsmouth to Columbus in order to take care of the increasing coal traffic from West Virginia to the lakes. The Chesapeake & Ohio R.R. Co. will build a bridge across the Ohio River at Sciotoville and thus a portion of the tonnage from that road can be diverted to the Hocking Valley Ry.

Grafton, W. Va.—The Winona Coal & Coke Co. with a mine located at Coffman, four miles from this city, is contemplating extensive improvements in the spring. This firm is now renting its coke ovens from another company, but is arranging to construct 60 ovens of the most improved type. Another mine opening will soon be made, and about 20 miners' houses, together with a power plant, were recently completed.

Martins Ferry, Ohio.—The Barton Coal Co. is planning to remodel its present tipple on the St. Clairsville branch of the C. L. & W. division of the Baltimore & Ohio R.R. to take care of about 800 acres of coal to the southwest of the present development. The tipple will be remodeled with a view to handling a larger daily tonnage.

McDonald, W. Va.—Twenty-two coal mines in the vicinity of McDonald in the New River field are to be electrified under plans which have been worked out by the Randolph-Means Co., of Pittsburgh, Penn. Contracts have been made with the West Virginia Power Co. for central-station current and arrangements are being completed to dismantle the individual power plants.

Greensburg, Penn.—The Randolph-Means Co. has contracted for the electrification of the Keystone Coal & Coke Co.'s Keystone Works at Greensburg, where an isolated-power plant will be discontinued and central-station power will be substituted. The latter will be supplied by the West Penn Power Co.

Greensburg, Penn.—The Greensburg Coal Co. is extending the electrical equipment of its mine and is installing an electric mine hoist to be operated on alternating current. This latter will be in operation shortly. This machine is believed to be the first installation of any importance of this type to be placed in the Pittsburgh district.

Robertsdale, Penn.—Extensive improvements are being made at the works of the Rock Hill Coal & Iron Co. at this place. A 500-hp. plant, including engines and generators, is being installed to operate the mine on alternating current. Contracts have been placed with the Ridgway Dynamo & Engine Co. for engines and generators.

NEW INCORPORATIONS

Chicago, Ill.—The Western Coal & Dock Co., of Chicago, has dissolved.

Frankfort, Ky.—The Belcourt Coal & Mining Co. of Webster County has increased its capital from \$3350 to \$5079.

East Chicago, Ind.—The Wisconsin Lumber & Coal Co. has increased its capital stock from \$25,000 to \$100,000.

Chattanooga, Tenn.—The Tennessee River Coal & Coke Co. has been incorporated with a capital stock of \$125,000, to develop coal.

Indianapolis, Ind.—The Oak Hill Coal & Mining Co., Vermillion County, and the Summit Mining Co., of Bloomfield, have dissolved.

Barbourville, Ky.—The Hazardtown Coal Co. has been organized with a capital of \$30,000. The incorporators are W. M. Jones, O. C. McClung, and J. B. Eversole.

Providence, Ky.—The Washington Coal & Coke Co. has been organized with a capital stock of \$3000. The incorporators are Henderson Foxwell, James A. Foxwell and I. Foxwell.

Marissa, Ill.—A certificate of dissolution of the Borders Coal Co. has been filed in the recorder's office. This is one of the oldest firms in the county, and the dissolution came as a surprise.

McAlester, Okla.—The North McAlester Coal Co., of McAlester, has been incorporated with a capital of \$5000. The incorporators are Richard E. Jones, Walter Cunningham and Rosy Jones, all of McAlester.

Marion, Ill.—The Economy Coal Co. has been organized with a capital stock of \$60,000 for the purpose of mining, buying and dealing in coal and fuel. The incorporators are H. G. Ferrell, S. H. Goodall and G. B. Campbell.

Lexington, Ky.—The Carnahan-Hudson Co. has been organized, with a capital stock of \$50,000, by Robert T. Carnahan, of Louisville, and George K. Graves, Leonard G. Cox and Charles N. Manning, of Lexington. The company will purchase and develop mineral and timber lands.

Albany, N. Y.—A charter has been granted to the Seiler-Blanchard Co. Inc. The capital stock of the company is \$25,000, and the offices will be located at No. 1 Broadway, New York City, and at Binghamton, N. Y. This firm will handle a well-known line of anthracite and bituminous coal.

Washington, Penn.—A charter has been filed for the Lindley Coal Co. The principal incorporators are William S. Morehead, Pittsburgh; John S. McKelvy, Jr., of Wilkinsburg, and William F. Knox, of Ben Avon. The company will engage in coal mining, and its principal offices will be located in Pittsburgh.

Welch, W. Va.—The Cumberland-Campbell Coal & Coke Co. has been organized with a capital stock of \$25,000. The chief works will be in McDowell, W. Va., and Harlan County, Ky. The incorporators are James B. Flanagan, of Welch, Ely L. Glade, of Chicago, J. M. Clay, of Louisa, Ky., J. W. Waldron and Thomas J. Flanagan, of Welch.

Charleston, W. Va.—The Acme Corporation of Parkersburg has been organized for the purpose of operating mines, drilling for oil, holding water rights, developing and selling electricity. The capital stock is \$250,000, of which \$2000 has been paid. The incorporators are S. D. Camden, C. C. Martin, Thomas Logan and W. W. Van Winkle, of Parkersburg, and W. W. Mills, of Marietta, Ohio.

INDUSTRIAL NEWS

Chattanooga, Tenn.—The Tennessee River Coal Co. is preparing to reopen its mines near Chattanooga, which have been closed down for more than a year.

Evansville, Ind.—It is announced here that seven more coal mines in western Kentucky will be acquired by the Deep Water Coal Co., of Pittsburgh. This firm recently took over 17 coal mines in western Kentucky and one mine in Newburg, Ind.

Belleville, Ill.—The mine of the Belleville Colliery Co., formerly known as the Lattmann mine, was sold recently to satisfy judgments and a chattel mortgage. It was purchased by Ben Gundlach for \$11,000. The judgments against the colliery company were for wages due miners employed.

Youngstown, Ohio.—It is estimated that the Pennsylvania R.R. spent for locomotive fuel last year \$11,187,448; the Baltimore & Ohio expended \$6,926,745; the Lake Shore, \$3,926,888, and the Michigan Central, \$3,323,535. The Lake Shore spent more for fuel than for repairs to engines.

Pineville, Ky.—The Pineville Coal Co. has purchased 1346 acres of coal land on Straight Creek and will establish a plant for a daily capacity of 1500 tons of coal. The equipment will include retarding conveyors, shaker screens, electrical machinery, etc., and contemplates the expenditure of about \$100,000.

Lansford, Penn.—The work of removing the large culm bank at Lansford is progressing rapidly, and it is expected that within a year, the ground which has been occupied by this refuse heap for more than 60 years will be divided into building lots. A scraper line is being installed to clean up after the steam shovel.

Monongahela, Penn.—Negotiations are under way for the sale of approximately 500 acres of coal land in Followfield Township by the Joseph Rider heirs, and others, to the Wanner-Leonard Coal Co. This firm operates the Leonard mine at Fayette City; also a mine at Brownsville. The main offices are in Cleveland, Ohio.

Moundsville, W. Va.—A deal has been consummated whereby Samuel Dorsey bought all of the coal underlying the land of Dr. M. F. Compton, turning the same over to the Mound Coal Co., which operates the mine on First St. The transaction gives the mining company an unrestricted right-of-way from the railroad to the Ohio River.

Seranton, Penn.—A sliding-scale bonus of \$1050 was recently awarded by the Archbald Coal Co. to the miners who worked for this firm in March, 1912. The matter was finally adjusted by district board members, Stephen Reap and Harry Kerins, and the first half of the bonus will be paid immediately, and the balance during the latter half of February.

Bristol, Conn.—The New Departure Mfg. Co. will shortly occupy its large and handsome administration building which has been in the course of erection for the past 12 months. De Witt Page, who has been identified with the company for some time, has been appointed general manager, and Chas. B. Treadway, Treas., becomes chairman of the Board of Directors.

Detroit, Mich.—The 1914 sale convention of the American Blower Co. was held in Detroit on Jan. 28 to 30, and was attended by about 50 of the company's sales and engineering representatives. Somewhat contrary to expectation, pessimism had no place whatever in any part of the convention, and the feeling was general that more and better business would be handled in 1914 than was booked during the previous year.

Harrisburg, Penn.—The State Department of Mines reports that 1141 mine workers were killed in and about the mines of Pennsylvania last year. Of these, 615 met death in the anthracite region, and 526 in the bituminous district. The number of employees in the first named field is given as 180,000, and in the latter 185,000. The bituminous miners produced 168,000,000 tons of coal against 90,000,000 produced in the anthracite field during the same period.

Washington, D. C.—Discrimination by the Pennsylvania R.R. on rates of bituminous coal in favor of the Keystone Coal & Coke Co. and the Jamison Coal & Coke Co., both of the Greensburg district as against the Pittsburgh Coal Co. was recently charged by the traffic manager of the latter company before the Interstate Commerce Commission, while testifying in the hearing on the proposed 5 per cent. advance in rate for the railroads in the Eastern classification territory.

Denver, Colo.—Holding that the Union Pacific, Chicago, Burlington & Quincy, and Colorado & Southern railroads are charging an exorbitant rate for carrying coal from the northern Colorado fields to Denver. Judge Terry recently upheld the findings of the State Railway Commission, and ordered a reduction amounting to approximately 30 per cent. Unless Judge Terry's ruling is reversed by the Supreme Court to which the railroads will go on a writ of error the rate fixed by the commission of 55c., 50c. and 45c. per ton for lump, run of mine and slack coal will prevail as against the present rates of 80c., 70c. and 60c. a ton, respectively.

Uniontown, Penn.—Figures from the office of the commissioners of Greene County show that J. V. Thompson, of Uniontown, is in all probability the most expensive individual holder of coal in the United States. Greene County has 18 townships, and in 17 of these, Thompson owns coal. His total holdings aggregate 120,000 acres. If an acre of coal after being mined and placed on the market is reckoned as worth \$10,000, this valuation of the coal held by Thompson would give a potential value of \$1,200,000,000. None of the coal held, however, has been developed, Thompson being a speculator in virgin coal and not interested in its mining or sale.

Coal Trade Reviews

General Review

Colder weather creates some activity in anthracite but the domestic sizes continue under heavy pressure; steam grades still short. Demurrage and embargoes the rule in bituminous. Conservative interests accumulating surpluses against a suspension Apr. 1.

The recent colder weather acted as a temporary stimulant to the anthracite trade, but the movement was so prompt that the situation was easily met before it had an opportunity to affect the wholesale end. The fact that the independent operators are finding it necessary to curtail their production is significant evidence of the trend of conditions in this branch of the industry. There is a heavy loading of lake vessels in the Buffalo harbors. Consumers in all departments report a substantial decrease in consumption and there are many who predict that even the large companies will be forced to make concessions on the winter circular before the customary time, Apr. 1. Operations are so heavily restricted, as a result of the poor demand for the domestic grades, that the steam sizes are becoming steadily shorter and commanding larger premiums. Anthracite shipments for January were the lowest for that month since 1905.

Nominal prices are being relatively well maintained in the Eastern bituminous market but the large amount of consignment coal on demurrage is resulting in many sales at ridiculously low prices. There is practically no demand for spot coal and while a few contracts are being closed for the new year, embodying clauses protecting the consumer against a further decline, most agents are not actively seeking business; in view of the adverse conditions prevailing it is difficult to negotiate on a profitable basis, and sellers hesitate to weaken their position by attempting to force the market.

The possibility of a protracted suspension, Apr. 1, is creating confusion and a great diversity of opinion prevails as to the result. The larger conservative Eastern buyers are showing a disposition to stock up heavily in spite of the miners' tentative offer to continue at work pending a settlement. In other districts, however, the buyers are already so heavily stocked in excess of current requirements that they will not consider further offers.

Considerable coal is reported in the Pittsburgh district accumulating demurrage and operations are restricted to probably not more than 50% capacity. Many orders in Ohio placed for February delivery have been canceled, and the market is in bad shape. Hampton Roads reports continued light demand for spot coal, but a rather increased movement on contracts has materially reduced accumulations. Hopes of any real winter weather in the South have been abandoned and the market is quiet with shipments below the average for this period of the year; companies will enter the summer trade with heavier stocks than ever before.

The first seasonable weather of the winter has occurred in the Middle Western market and created a more active situation there. This has checked the tendency to cut prices and mine operations are much better, while the improvement in other lines of industry is also helping the situation. Some buying in anticipation of the impending labor troubles is also noted.

EASTERN MARKET

BOSTON

Active canvass for contracts by Hampton Roads agencies. No significant concessions in price thus far. No demand for spot coal. Water freights rather unfavorable to Pennsylvania coals and little doing. Anthracite extremely quiet.

Bituminous—The Pocahontas and New River shippers are actively canvassing for contract business. A few large orders have been entered through the customary channels and with the usual clause protecting the buyer against a decline in price and also including a provision with regard to the possible advance in tolls. Such arrangements are, of course,

only options and have no direct bearing on the future of the market, but this is the only form in which buyers will consider making contracts at least for the present; \$2.85 is still being maintained as the base price and what concessions are heard are confined to the smaller agencies who have to deal with accumulations at the Hampton Roads piers. Shipments from that quarter are still light for the season.

For spot coal there is practically no demand whatever in this territory. A large cargo of Southern coal was delayed here, discharging for more than a week recently, awaiting orders for distribution inland; that sort of procedure always has a depressing effect on what market there is. Stocks are large in every direction and nothing short of extravagant inducements will bring forth any material amount of business.

The high range of water freights maintained out of Philadelphia operates against any call for the Pennsylvania grades along the coast and what small orders offer are likely to find their way to the coals from Hampton Roads. Practically all the Pennsylvania districts, as well as Georges Creek, are under heavy curtailment, with no significant change in sight.

Anthracite—There is only a scattering demand for sizes, but some improvement is hoped for from the colder weather. Stocks to the Eastward are running down and there is reason for predicting a good demand as soon as April prices are in force. The independents are little heard from in this territory, and practically all the coal that is sold is on the current company circular. Moderate supplies continue to come forward to storage depots.

From all quarters it appears that the consumption of stove size is still increasing, while egg is as steadily growing less in demand. It will be interesting to see how this situation works out the coming season.

Wholesale quotations on bituminous are about as follows:

| | Clearfields | Cambrays Somersets | Georges Creek | Pocahontas New River |
|-------------------------------|-------------|-----------------------|------------------|-------------------------|
| Mines* | \$0.95@1.50 | \$1.25@1.55 | \$1.67@1.77 | |
| Philadelphia* | 2.20@2.75 | 2.50@2.80 | 2.92@3.02 | |
| New York* | 2.50@3.00 | 2.80@3.10 | 3.22@3.32 | |
| Baltimore* | | | 2.85@2.95 | |
| Hampton Roads* | | | | \$2.80@2.85 |
| Boston* | | | | 3.58@3.65 |
| Providence* | | | | 3.58@3.68 |
| *F.o.b. ^t On cars. | | | | |

NEW YORK

Many embargoes are being declared on soft coal. Few negotiations on contracts for the new year. Much demurrage coal and some low prices being heard. Heavy pressure on domestic grades of anthracite with steam sizes in strong demand.

Bituminous—Further recessions continue to mark the local soft-coal trade. There are large surpluses of coal at South Amboy and embargoes have been declared against certain consignees; these are having a beneficial effect upon the situation, however, by curtailing the shipment of market tonnages into a trade already oversupplied with coal of all kinds. On Feb. 9 the Philadelphia & Reading Ry. announced embargoes on all shipments of bituminous coal to consignees at Port Richmond, Philadelphia and Port Reading, N. J.

The movement on contracts continues to be the mainstay of the market, particularly for those operators who are not attempting to overload their customers. However, even the contract movement is getting steadily weaker, although there are a few consumers who are taking some extra in anticipation of a suspension Apr. 1. On contracts for the new year, the conservative selling agencies are not attempting to push for business, believing that their position would be materially weakened, should they do so in the face of the adverse conditions now prevailing. Consumers, on the other hand, are holding off, awaiting developments. Operations are already heavily restricted, and if no suspension occurs, the outlook for the summer business is decidedly pessimistic.

Because of the large amount of demurrage coal being negotiated, abnormally low prices are heard, as much as

45c., f.o.b. mines, being on gas coal. This condition is due to operators attempting to force the market, being ready to make sacrifices in order to hold their mine organizations together. Disregarding such sales of demurrage coal, we quote the nominal New York market off 5 to 10c. per ton from last week as follows: West Virginia steam, \$2.50@2.60; fair grades Pennsylvania, \$2.60@2.70; good grades of Pennsylvania, \$2.60@2.70; best Mille Pennsylvania, \$3.10@3.15; George's Creek, \$3.15@3.25.

Anthracite—Although the recent cold weather has had a momentary stimulating effect upon the situation, the market continues discouragingly flat and devoid of interest. Operations in the mining regions are being restricted in an unprecedented manner for this period of the year, the curtailment being shared in by the large companies and individuals alike. A conservative estimate places the operations at not to exceed 60% capacity, as maximum.

The pressure is concentrated entirely upon the domestic grades, as is to be expected. The difficulty in moving these has resulted in the curtailment of mining and has also placed the producers in an embarrassing position as regards the steam grades. Contracts were entered into for tonnages of these latter, gaged upon full-time operations; obviously, with mining restricted as it is, the expected output of the small sizes is not being realized, with the result that producers are unable to meet their obligations on these grades. It is not surprising, therefore, that premiums are being freely offered for all kinds of small coal, while the reverse obtains in the prepared grades, all of which are a drug on the market.

We quote the New York market on the following basis:

| | Upper Ports | | Lower Ports | |
|--------------|-------------|-------------|-------------|-------------|
| | Circular | Individual | Circular | Individual |
| Broken... | \$5.00 | \$4.50@4.75 | \$5.05 | \$4.45@4.70 |
| Egg... | 5.25 | 5.00@5.25 | 5.30 | 4.65@5.20 |
| Sto... | 5.25 | 5.00@5.25 | 5.30 | 5.00@5.20 |
| Chestnut... | 5.50 | 5.35@5.50 | 5.55 | 5.35@5.45 |
| Pea... | 3.50 | 3.40@3.50 | 3.50 | 3.15@3.45 |
| Buckwheat... | 2.75 | 2.75@2.85 | 2.70@3.45 | 2.25@2.80 |
| Rice... | 2.25 | 2.25@2.35 | 1.95@2.20 | 1.85@2.30 |
| Barley... | 1.75 | 1.75@1.80 | 1.70 | 1.55@1.70 |

PHILADELPHIA

Anthracite situation receives impetus due to colder weather. Steam sizes in active demand, but domestic market well supplied. Bituminous unchanged, but still reflecting low prices and limited demand.

Weather conditions have been more favorable during the past week for the anthracite coal trade, and while the wholesale market has not felt the impetus as yet, the retail end has profited more or less. While both classes of the trade seem to feel more optimistic, the general idea seems to prevail that one week of winter will not bring about any lasting results; the householders, recognizing that winter weather in this vicinity is not likely to last much longer, will economize to the greatest extent in the purchase of coal, and it will require at least four to six weeks of a continuous spell to dispose of the large stocks which most of the dealers are carrying. Many of them are doing considerable shopping in the face of the present market conditions, and are doubtless securing bargains on almost all of the prepared sizes.

The fact that even the individual operators have been curtailing operations at their mines does not speak well for the market, and judging from reports, they are having difficulty in disposing of their output at that. The large companies are still adhering to circular prices. It is understood with the curtailed mining, it has been impossible to fill contract obligations on the steam grades, and large inroads are being made into stocks; buckwheat is in particularly short supply. Broken coal seems to be about the only senior size that is short of the market, the contracts in some cases being far behind actual requirements; operators claim they cannot mine coal to supply a market for only certain sizes as they have to dispose of all.

The tidewater market from this city has fallen flat. Orders are few and far between, and it is understood that many of the barges of the transportation companies are being tied up on account of the lack of business. Everybody seems to be postponing taking on additional coal as long as possible, and the New England market is said to be well filled.

Depressing influences still continue to characterize the bituminous market in the shape of poor prices, and limited demand. Inferior coals are being offered as low as 80@90c. at the mines, and they are not particularly easy to dispose of at that. Better grades of coal are ruling at 35@40c. higher.

BALTIMORE

Cold snap has proven highly beneficial to the anthracite trade. Bituminous business still rather flat, with prices poor. Rumors of anticipated labor trouble causing interest. Heavy shipments over the piers.

A welcome drop in temperature has already had a distinct influence for good on the anthracite trade. The hard-coal business here has been flat for several weeks, but there is now a briskness to orders that is most encouraging. The movement from mines to tide proved prompt, however, and the situation was easily met as regards the domestic grades. There has been a growing demand for this latter class of coal here despite the fact that dealers have several times advanced the price.

While the soft-coal situation is for the moment uneventful there are rumors of labor troubles the coming April. In the face of the recent poor demand for soft coal and the low schedule of prices an unsettled labor situation might not prove entirely unwelcome. A little more activity was shown in West Virginia gas coals the past week, this fuel having recently been the most unsatisfactory feature of a poor market generally. Three-quarter gas is still selling to the trade at the mines around 80c. Steam coals of West Virginia are averaging around 90 and 95c. with liberal offerings on prompt delivery. Pennsylvania lower grades are running from 90c. to \$1 while the best grades still hang at from \$1.20 to \$1.30.

The trans-shipment business here is quite satisfactory, at least to some handlers, as considerable business is being done both coastwise and to foreign ports. The vessel charter situation still remains easy in spite of a number of closings. There is considerable range in charters, African, European, South American and Central American loadings being noted since the first of the year, during which a total of about 100,000 tons has been exported up to the start of the present week.

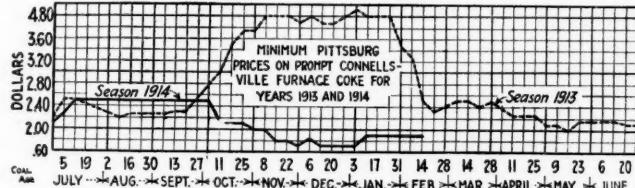
CENTRAL STATES

PITTSBURGH, PENN.

No prospect of wage scale agreement at Philadelphia conference, begun this week, and little possibility of mining suspension being avoided. Mine operations lighter, at less than 50% of capacity. Connellsburg coke market quiet, but with better undertone. Shipments increased.

Bituminous—It is out of the question that this week's scale conference at Philadelphia should reach an agreement, but it is barely possible that arrangements will be made whereby there will be no suspension of mining in case agreement on the scale is not reached by Apr. 1. The balance of probabilities is clearly that there will be a suspension, and one of considerable duration. Some of the demands of the men, as formulated at the Indianapolis convention, are regarded by operators as impossible.

The coal market continues flat, owing to light domestic, industrial and railway demand. A sharp cold snap reached the district Sunday and domestic demand may prove better for a few days. There is considerable coal at distributing points without instructions, and demurrage is accumulating, resulting, it is claimed, in the railroads picking up some coal at bargain prices which will be held against the possible suspension of mining. Mining operations are somewhat reduced, and probably average less than 50% capacity. A number of mines are entirely idle, while many others are operating only from two to four days a week. Prices are rather badly cut on free coal, and even in some instances on slack, the regular circular prices remaining as follows: Slack, 90c.; nut and slack, \$1.05; nut, \$1.25; mine-run, \$1.30; 3/4-in., \$1.40; 1 1/4-in. steam, \$1.50; 1 1/4-in. domestic, \$1.55, per ton at mine, Pittsburgh district.



Connellsburg Coke—The market has been quiet as to actual transactions, but is showing an improved undertone. It is believed that low-priced sellers are fairly well filled for as large a tonnage as they would care to take at under the \$2 asking price of the majority of operators, while the somewhat significant incident has occurred that the Producers' Coke Co. has withdrawn all prices for shipment after Apr. 1. The move is not necessarily of significance from the fact that any inquiry likely to develop is only for early de-

livery, and the companies represented in this selling agency are not likely to miss any business by staying out of the market for the later delivery; at the same time they are placing themselves in position to profit by any material improvement that may occur in the iron situation and any sharp demand that might arise for raw coal through a suspension of mining in the union districts. It is claimed that under normal coal market conditions there is about as much profit in coal as in coke at less than \$2. The coke market continues to be quotable as follows: Prompt furnace, \$1.90; contract furnace, \$1.90@2; prompt foundry, \$2.40@2.60; contract foundry, \$2.40@2.60, per ton at ovens.

The "Courier" reports production in the Connellsville and lower Connellsville region in the week ending Jan. 31 at 301,055 tons, an increase of 10,000 tons, and shipments at 298,541 tons, an increase of 7955 tons.

BUFFALO, N. Y.

Capricious weather and too much coal weakens all prices. No strong market till steady low temperatures set in. Miners' actions closely watched. Loading vessels.

Bituminous—The market has strengthened a trifle, but the general erratic weather has kept prices unsteady. It is getting so late now that the trade is not looking for much of a market this winter unless it is later found that there is not likely to be coal enough to last through a reasonably long mining suspension. While it was announced that the miners would continue work after Apr. 1, pending a fixing of mining prices, the operators say the mines will be closed at the end of March and remain so till there is some profit in the business. This is the feeling all through the mining districts. Some of the operators say they expect to be shut down till sometime into May.

The miners are complaining that they do not get as much work as they need, mines often running only about half time, due to the condition of the market. Still there are many members of the trade who are decidedly cheerful; iron moves more freely and some are saying that by Mar. 20 there will be a good volume of all sorts of business. There is much activity in Buffalo harbor. The loading of anthracite for lake shipment in the spring has been resumed and the steamers are mostly putting on their fuel against shortage next April. As they are taking about 500 tons each the aggregate is large.

Bituminous prices are slightly stronger on the basis of \$2.80 for Pittsburgh lump, \$2.70 for three-quarter, \$2.55 for mine-run and \$2.10 for slack. The price of Allegheny Valley is about 25c. lower for sizes, with slack about on a par with Pittsburgh.

Coke—There is no particular stir in coke. The amount going into consumption is larger than it was a month ago, but that appears to be only just enough to keep it from going lower. Prices are based on \$4.50 for best 72-hr. Connellsville foundry.

Anthracite—The trade has not improved materially. Mines are running slow, and there is much complaint of stocks at practically all points. Consumers are reporting a large reduction in the amount consumed and indications are that not only the independents, but larger interests also will sell at April prices sometime before these go into effect. The retail trade has done less business here so far this winter than during any similar time on record.

COLUMBUS, OHIO

Ohio trade fast approaching demoralization. Circular prices being cut, and there is considerable tonnage on track. Not much stocking against a shortage in case of a suspension.

With low prices prevailing for all grades of coal and with no disposition on the part of steam users to stock up the coal trade is weak and quiet. Operations are at a low ebb and sales managers are able to place scarcely any tonnage. On the whole the market is in bad shape.

Production has become still smaller during the week as many mines have been closed down entirely and others are being worked with only a small force. Several operators who have been shipping on consignment have stopped which has cut into production still further. In the Hocking Valley the output is estimated from 35 to 40% of the average and the Pomeroy Bend district produced about the same percentage. In the domestic fields the output was about 25% of normal. In eastern Ohio the reports show that about 40% of the average was produced during the week.

Domestic business is slow as dealers are not inclined to stock up; their bins are full and the weather has been such that they cannot move it. Many of the orders placed by retailers for delivery early in February have been canceled. Domestic lump and $\frac{3}{4}$ -in. are a drug on the market and spot coal can be bought for almost any price. There is some little demand for the fancy grades of rescreened West Virginia and Pocahontas.

Steam business is steadier but there is unusual quietness. Factories are taking about their usual requisitions, which means they are gradually accumulating stocks as their daily needs are not equal to receipts. Only a few railroads which do not touch the coal fields are stocking up any.

Most of the operators in the Ohio fields believe nothing can prevent a suspension after the expiration of the present wage agreement. The statement comes from West Virginia that there will be a suspension in that state also, in order to allow the tonnage on track to be cleaned up. Prospects for an active lake trade next season are not very promising as there is still a large amount of coal on the docks at the upper lake ports.

Quotations in the Ohio fields are as follows:

| | Hocking | Pittsburgh | Pomeroy | Kanawha |
|----------------------|---------------|---------------|---------------|---------------|
| Domestic lump..... | \$1.40 @ 1.35 | | \$1.50 @ 1.45 | \$1.40 @ 1.35 |
| 3-4 inch..... | 1.25 @ 1.20 | \$1.20 @ 1.15 | 1.35 @ 1.30 | 1.30 @ 1.25 |
| Nut..... | 1.25 @ 1.20 | | 1.30 @ 1.25 | 1.20 @ 1.15 |
| Mine-run..... | 1.10 @ 1.05 | 1.10 @ 1.05 | 1.15 @ 1.10 | 1.10 @ 1.05 |
| Nut, pea and slack.. | 0.80 @ 0.75 | | 0.80 @ 0.75 | 0.80 @ 0.75 |
| Coarse slack..... | 0.70 @ 0.65 | 0.95 @ 0.90 | 0.70 @ 0.65 | 0.70 @ 0.65 |

CLEVELAND, OHIO

A slight improvement in the demand for slack. Close of last week developed temperatures approaching zero which gave the coal market a boost. Some larger manufacturers taking contract coal and the market has the appearance of cleaning up.

The colder weather that threatened northern Ohio the first of the month failed to materialize and last week the weather was almost spring like until Saturday, when a real cold wave swept the northern part of the state.

In spite of the warm weather the American Steel & Wire Co. began taking coal from its shippers who had been shut off for two weeks. Many factories have been embargoed because they cannot unload the cars. The American Steel & Wire Co. has a 30 day's supply on hand and many other plants have from two to three weeks' stock stored away; the Lake Shore R.R. has a month's supply of coal docked and other roads have stocked some, but more docking will be done before Apr. 1.

The hard-coal market has been so slow car service is being paid on coal on track. Until the cold wave struck the city, both Cleveland and its surrounding market offered little immediate prospect of absorbing the small amount of anthracite on hand.

The retail trade has had a fair business under the adverse conditions. None of the larger firms had all of their equipment working though, considering the weather, they did very well.

The wholesale market was well stocked with lump coal, especially from the No. 8 district. The larger demand for slack has left three-quarter, and inch and a quarter sizes to be disposed of on an overstocked market. This resulted in a continuation of the low prices on the larger coals, while slack was sold at an advance of 5c. Pocahontas is as low as it has been for several months. The fall prices were from 50 to 60c. above those that are prevailing today.

The Massillon district is not sending its product into the flat market. Many of the mines are shut down or working only a small part of the time. Operators in this district have a single price below which they cannot go without losing money and they have maintained this circular so far. Prices ranged a little higher last Saturday than during the middle of the week. Although the amount of coal that comes into Cleveland on Sunday and Monday tends to take the edge off the market as it closed the previous week, a continuation of the cold weather will probably bring a decided betterment during the next few days.

| | Sales of spot coal were made at the following car prices: | | |
|---------------------------------|---|-----------------|------------|
| | No. 8 | Middle District | Pocahontas |
| Lump, 1 $\frac{1}{4}$ -in. | \$2.00 @ 2.10 | \$1.90 @ 2.20 | \$3.25 |
| Lump, $\frac{3}{4}$ -in. | 1.90 @ 2.00 | 1.85 @ 1.90 | |
| Mine-run..... | 1.85 | 1.75 @ 1.80 | 2.75 |
| Egg..... | | | 3.25 |
| Nut..... | 2.10 | | |
| Slack..... | 1.80 @ 1.85 | 1.70 | |

DETROIT

Demurrage coal disappearing and a better tone evident in most quarters. Embargoes on local roads. Buyers becoming anxious.

With all the railroads leading into Detroit embargoed against fuel, and the recent sudden cold snap operators and jobbers are beginning to be optimistic. The steam business has shown a specially marked improvement in the last few days.

Buyers are anxious to be taken care of, and the several hundred cars of demurrage coal that have been on local tracks for the past three weeks are melting away quite rapidly as the demand increases. Should the cold weather continue, and the railroads delay in raising the embargo, it is possible that Detroit may experience a slight coal famine

within the next 10 or 15 days; should the weather moderate to any great extent, and the embargo raised, the local market will again be flooded with steam fuel from West Virginia, Ohio and Indiana, in such large quantities that it will be difficult to obtain even 50c. a ton for mine-run.

Anthracite—The large supplies of hard coal, are now being disposed of quite rapidly. The demand has increased materially and for spot cars, 25c. above circular is being asked.

HAMPTON ROADS

Conditions at Hampton Roads improving. Total dumpings for January. Accumulation of coal on railway yards somewhat reduced.

The situation at Hampton Roads is gradually improving and although there is little demand for spot coal the movement on contract during the week has considerably reduced the accumulation of cars on the various railway terminals. The largest shipments coastwise, as usual, have gone to the New England market with a fair number of cargoes moving foreign. These latter went to Bermuda, Canal Zone, Barbadoes, Dakar, Havana, Santiago, Rio, Kingston, St. Thomas, Valparaiso and Genoa. Perhaps the largest shipment of the week was that moving to Genoa this cargo amounting to about 10,400 tons. Approximately 2600 tons moved by schooner from Hampton Roads to Ponce, Porto Rico. The commander of the French oil supply ship "Garonne" asked for bids for supplying French government vessels with bunker coal at Hampton Roads. It is understood the price made was the regular foreign bunker rate plus cost of barging and stevedoring for such vessels as could not load at piers and the regular foreign bunker price for such as bunkered at piers. This contract is to cover 1914.

Dumpings over Hampton Roads piers for January amounted to 984,301 tons. Of this quantity the Norfolk & Western Ry. at Lamberts Point dumped 508,212 tons, the Chesapeake & Ohio Ry. from Newport News 247,219 tons and the Virginian Ry. from Sewalls Point 230,870 tons. From these figures it will be seen that the Norfolk & Western dumped considerably more than the other roads combined.

LOUISVILLE, KY.

Colder weather stimulates retail trade, but arrived too late to help the wholesale business. Prices on a midsummer basis. Steam market improving.

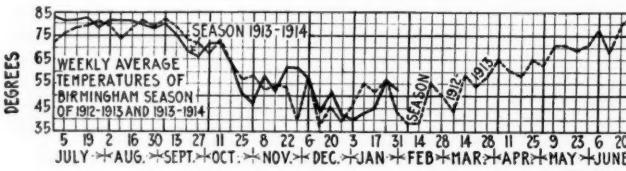
While the belated cold wave has finally arrived, the effect so far has not been noticeable in the wholesale end of the trade although the retailers have profited by the resulting increase in the demand. As pointed out heretofore, it will take a prolonged period of low temperatures to reduce retailers' stock to a point where they will have to place new orders, and the lateness of the season makes it improbable that the present cold snap can last long. Small orders are the rule with domestic consumers, and there is little doubt but what hand-to-mouth buying will continue. The total volume of business will be much smaller than it would have been had the present severe weather occurred a month or more ago.

SOUTHERN AND MIDDLE-WESTERN

BIRMINGHAM, ALA.

Little improvement in coal and coke. Market quiet and shipments below the average for this season of the year. Heavy tonnage of pig iron booked and prices advanced to \$1 f.o.b. Birmingham, for 2 Foundry. Car situation satisfactory.

This week has shown little improvement in either steam or domestic coal. Warm summer-like weather has prevailed



for the past week, and lump coal is in small demand, though colder weather is predicted for the next ten days, which may bring about an improvement; prices are from 25 to 50c. per ton less than the February circular. Steam coal is also feeling the effects of the quiet market, but unlike the lump, the prices are holding up well under the circumstances. Furnace

and foundry coke are quiet, sales in small tonnages only being made. Blacksmith coal is slightly better than last week, prices being from \$2 to \$2.25 f.o.b. mines.

A heavy tonnage of pig iron was again booked by the furnace companies, which are now holding for \$11 f.o.b. Birmingham for 2 Foundry, some sales being made at \$11.50. The iron market is in a better condition than it has been for several months. The car supply is quite adequate for the demands at this time.

NEW ORLEANS

Local sales much below last year. Larger business anticipated this summer due to higher prices of fuel oil.

All hope of protracted cold weather has been abandoned by retail dealers here. Sales for domestic purposes are 45% lighter this year than normal. As a result the influx of coal from the mines has been suspended as practically every company will enter the summer with larger stocks than ever before has been the case. It is expected, demand this summer will be larger, due to the number of steam plants that are returning to the use of coal because of increasing cost of petroleum.

INDIANAPOLIS

January was an unusually poor month but February weather is putting the coal trade at its best. Consumption of domestic grades has a boom and factory needs are gradually increasing. Mines working on slightly better time and prices hold firm.

February is displaying the most seasonable weather Indiana has had since summer ended. January was one of the mildest winter months on record for this state and the coal dealers, who had counted on making up for the slowness of fall trade were sorely disappointed. February came in with snow and sleet that not only increased the consumption of coal but caused much damage to wire communication and delayed transportation. The sun came out the third day but later a cold wave followed that carried the temperature down to about zero and retail coal dealers all over the state quickly fell away behind orders.

This was what was needed to stiffen the coal market, as there were reports of a shading of prices, which seemed to threaten to become general. As it is, no change is made from the retail schedule adopted at the beginning of the season. Mine prices are firmer and operations better, due to the cold spell and some improvement in the industrial situation. There is a general preparation for greater activity in this line and the working forces are being slowly but steadily enlarged, though in some cases, hundreds of men are taken back at once.

CHICAGO

Market continues soft. Producers eager to accept business at almost any price. Smokeless mine-run selling at \$1@1.05, while lump and egg are being disposed of at \$1.50. The top price for Carterville lump, egg and No. 1 washed is \$1.80. Coke prices remain nominal.

"Continued soft" is the essence of comment among Chicago coal dealers, so far as market conditions are concerned. While zero weather has visited the territory this winter, it has not remained long enough to have any appreciable effect upon business. Producers and wholesalers will accept almost any price that is offered. Unusual weakness has been shown in the smokeless coal market; sales of smokeless mine-run at \$1 and \$1.05 have been frequent and lump and egg are being sold as low as \$1.50.

The splint coal market, nominally, is \$1.50 on shipments direct from the mines, but a large amount of large-sized splint lump on demurrage is being sold as low as \$1 a ton. As a result of a general scramble for business, Franklin County operators are selling lump and egg at from \$1.40@1.60, the mines. Quotations for mine-run range between \$1.15 and \$1.20.

Carterville operators are seeking business at almost any price that will attract trade. The top price for lump, egg and No. 1 washed is \$1.60, and a less figure is being accepted for coal on demurrage. Springfield operators have been compelled to shade prices as a result of sharp competition.

Coke prices are practically nominal. Sales are made with difficulty as the current demand is light. There has been a slight upward tendency in the steam trade, but conditions are far from satisfactory.

Prevailing prices in Chicago are:

| | Springfield | Franklin Co. | Clinton | W.Va. |
|--------------------|-------------|--------------|-------------|-------------|
| Domestic lump..... | \$2.07@2.17 | \$2.45@2.65 | \$2.12@2.27 | |
| Steam lump..... | 1.87 | | 1.97 | |
| Egg..... | | 2.45@2.65 | | \$3.90@4.30 |
| Mine-run..... | 1.82 | 2.20@2.25 | 1.87 | 3.20@3.45 |
| Screenings..... | 1.37@1.42 | 1.70@1.80 | 1.37@1.42 | |

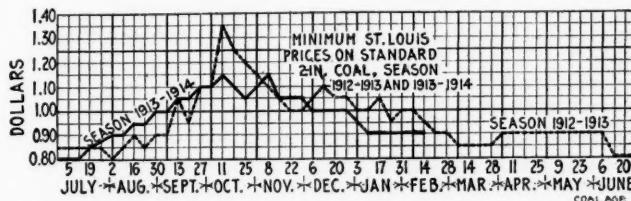
Coke—Connellsville, \$5.25@5.50; Wise County, \$5@5.25; byproduct, egg, stove and nut, \$4.90; gas house, \$4.65.

ST. LOUIS

Seasonable weather has caused an advance in prices, which will likely continue if cold wave holds out. Steam sizes still weak and slow movement of anthracite, coke and smokeless. Some storage supply being bought in anticipation of a suspension.

The first real touch of winter, as far as cold weather was concerned, arrived last Saturday, and it had a decidedly good effect on the market, beginning Monday. Prices advanced slightly on nearly all grades, and if the weather continues cold the latter part of the week will see a general advance that will likely continue.

There has been some buying of storage coal in the last few days, which has brought about healthier conditions in certain sizes, but on the whole there has been no material change. The washed-coal market is in a deplorable condition, with the exception of Nos. 4 and 5, which seem to be in fairly good demand.



The middle of last week Franklin County went down to \$1.20 and Carterville to \$1.05 on the domestic sizes. Standard 2-in. lump was sold freely at 80c. On the other hand, there was no advance in the screenings price. Carterville being held at about 60 to 65c. and Standard at 40 to 45c. A few plants in the south are storing coal, but there seems to be no inclination on the part of Northern steam users or railroads to acquire any surplus.

Anthracite, smokeless and coke are coming in with no demand, and going at any price the market will bring.

Prices continue unchanged from last week.

KANSAS CITY, MO.

Colder weather and an increased demand for fuel. Mine operations increased. Failure of gas supply has an important bearing on the market.

The market has stiffened to an appreciable degree, though no actual advance in quotations has yet been made. A continuance of present conditions, however, will result in this action. The situation is further improved in Kansas City and other cities in the Southwest, through the partial failure of the gas supply. The reserve accumulated during the mild weather has been consumed and the obvious and only remedy is to utilize coal.

PORTLAND, ORE.

Mild weather continues and little business being negotiated. Some interest over opening of Alaskan coal lands.

The Pacific Northwest is still enjoying a mild open winter and as a consequence the demand for coal for domestic purposes is not heavy.

The Portland Chamber of Commerce is investigating the possibility of cheaper coal on the Pacific Coast if the proposed government railroad is built into the interior of Alaska, and it is pointed out that with less expensive fuel the demand would be much larger than now as coal would displace other fuels and also stimulate industrial activity now hampered by the prohibitive fuel prices.

PRODUCTION AND TRANSPORTATION STATISTICS

IMPORTS AND EXPORTS

The following is a comparative statement of imports and exports in the United States for November, 1912-13, and for the 11 months ending November, 1911-12-13, in long tons:

| Imports from: | 11 Months | | November | | |
|-----------------------------|-----------|-----------|-----------|---------|---------|
| | 1911 | 1912 | 1913 | 1912 | 1913 |
| United Kingdom. | 8,290 | 6,294 | 5,329 | 1,430 | 70 |
| Canada..... | 873,265 | 1,204,416 | 979,980 | 124,714 | 82,491 |
| Japan..... | 11,373 | 25,663 | 99,437 | 4,945 | 10,322 |
| Australia and Tasmania..... | 207,945 | 151,928 | 160,754 | 11,426 | 19,176 |
| Other countries. | 355 | 2,202 | 3,296 | 97 | ..... |
| Total..... | 1,101,228 | 1,480,503 | 1,248,796 | 142,612 | 112,059 |

Exports:

| | | | | | |
|------------------|------------|------------|------------|-----------|-----------|
| Anthracite..... | 3,312,755 | 3,404,958 | 3,927,995 | 372,207 | 329,652 |
| Bituminous, | | | | | |
| Canada..... | 9,917,740 | 9,838,701 | 12,749,300 | 930,733 | 1,086,831 |
| Panama..... | 451,743 | 423,327 | 452,551 | 27,100 | 32,871 |
| Mexico..... | 449,671 | 269,007 | 439,427 | 12,350 | 22,165 |
| Cuba..... | 941,504 | 1,033,220 | 1,200,958 | 89,958 | 89,385 |
| West Indies..... | 511,608 | 602,406 | 548,454 | 38,458 | 24,194 |
| Argentina..... | ..... | ..... | 70,048 | ..... | 8,171 |
| Brazil..... | ..... | ..... | 250,663 | ..... | 9,564 |
| Uruguay..... | ..... | ..... | 5,163 | ..... | ..... |
| Other countries | 608,076 | 1,383,092 | 1,140,217 | 55,378 | 39,944 |
| Total..... | 12,880,342 | 13,549,753 | 16,856,781 | 1,153,977 | 1,313,125 |
| Bunker coal..... | 6,118,494 | 6,766,443 | 7,093,271 | 610,153 | 610,251 |

ANTHRACITE SHIPMENTS

As anticipated, the hard-coal shipments for January experienced a sharp decline, amounting to only 5,175,732 tons as compared with 5,663,618 tons in December, and 6,336,419 tons in January of last year. Shipments were the lowest for this month since 1905, when 4,408,575 tons were handled. The nearest approach to this low record since that time was in 1909 when 5,183,345 tons were shipped.

It is interesting to note that the Reading company has again resumed the leadership as the largest mover of hard coal in the country. For the first time in the history of the anthracite statistics the Lehigh Valley outstripped the Reading in shipments last December by some 4000 tons, but Reading again assumes the lead in January by a comfortable margin of fully 20 per cent.

A rather encouraging feature of the current situation is the comparatively light stocks reported at tidewater. On Jan. 31 the stocks were 591,094 tons as compared with 602,328 tons Dec. 1. As compared with Jan. 31, 1913, stocks are considerably larger, supplies on that date being 375,566 tons, and on Jan. 31, 1912, 521,283 tons.

January shipments were as follows:

| | Domestic | | Steam | | Total |
|-------------------------|-----------|-----------|---------|---------|-----------|
| | 1914 | 1913 | 1914 | 1913 | |
| Phila. & Reading.. | 888,210 | 1,118,635 | 126,916 | 138,497 | 1,015,126 |
| Lehigh Valley..... | 753,819 | 1,062,367 | 56,769 | 112,784 | 810,588 |
| Cent. R. R. N. J. | 604,368 | 691,764 | 100,123 | 121,603 | 704,491 |
| Del. Lack. & West. | 525,481 | 758,576 | 93,457 | 163,523 | 618,938 |
| Del. & Hudson.... | 509,582 | 563,369 | 77,311 | 89,808 | 586,893 |
| Pennsylvania..... | 458,356 | 505,873 | 77,762 | 70,679 | 536,118 |
| Erie..... | 602,331 | 596,165 | 103,972 | 121,070 | 706,303 |
| Ont. & Western.... | 179,544 | 202,916 | 17,721 | 18,790 | 197,275 |
| Total..... | 4,521,691 | 5,499,665 | 654,041 | 836,754 | 5,175,732 |
| | | | | | 6,336,419 |

SOUTHWESTERN TONNAGE

The following is a comparative statement of the Southwestern tonnage for September and the first nine months of the years 1912 and 1913:

| State | September | | Nine Months | |
|---------------|-----------|-----------|-------------|------------|
| | 1912 | 1913 | 1912 | 1913 |
| Missouri..... | 242,871 | 250,763 | 2,122,744 | 2,049,969 |
| Kansas..... | 424,329 | 474,237 | 3,628,190 | 4,060,330 |
| Arkansas..... | 169,325 | 201,782 | 1,374,474 | 1,406,787 |
| Oklahoma..... | 249,604 | 297,213 | 2,064,561 | 2,523,135 |
| Total..... | 1,086,129 | 1,223,995 | 9,189,969 | 10,040,221 |

This statement only covers the tonnage of members of the association, which is estimated to be at least 95% of the entire tonnage produced in the four states.

CHESAPEAKE & OHIO R.R.

The following is a statement of the coal and coke tonnage over the C. & O. R.R. for December, 1912 and 1913:

| | Coal | | Coal and Coke | | Nov. | |
|----------------|-----------|-----------|---------------|-----------|-----------|-----------|
| | December | 1912 | 1913 | December | 1912 | 1913 |
| New River..... | 463,230 | 469,490 | 502,230 | 485,550 | 486,230 | 518,520 |
| Kanawha..... | 708,980 | 958,740 | 787,400 | 712,520 | 961,020 | 880,040 |
| Kentucky..... | 153,180 | 145,810 | 155,970 | 155,610 | 157,060 | 163,920 |
| Total..... | 1,325,390 | 1,574,040 | 1,535,600 | 1,353,680 | 1,604,310 | 1,562,480 |

FOREIGN MARKETS

GREAT BRITAIN

Jan. 30—Supplies of large coals of most Admiralty qualities are abundant for early shipment, and the market is irregular in tone. Monmouthshire large coals are steadily held for prompt. Quotations are approximately as follows:

| | | | |
|-----------------------|--------|--------------------------|--------|
| Best Welsh steam..... | \$4.50 | Best Monmouthshires..... | \$4.17 |
| Best seconds..... | 4.38 | Seconds..... | 4.05 |
| Seconds..... | 4.26 | Best Cardiff smalls..... | 2.70 |
| Best dry coals..... | 4.38 | Seconds..... | 2.52 |

The prices for Cardiff coals are f.o.b. Cardiff, Penarth or Barry, while those for Monmouthshire descriptions are net f.o.b. Newport; both exclusive of wharfage, and for cash in 30 days.

Financial Department

The Coal and Coke Railway Company

President H. G. Davis, of this company, reports, in part, for year ending June 30, 1913, as follows:

Railway Earnings—While the gross revenues increased 11.6%, or \$129,911, the operating expenses increased 18.6%, or \$126,801. The expenses were increased chiefly by the higher wages paid to engineers, firemen and trackmen and the cost of repairs, amounting to some \$20,000, necessitated by the floods of last summer. The net earnings from railway operations, after deducting taxes of \$42,000 and ground rents of \$2254, were \$396,829, a slight increase over 1911-12.

Coal Department—There was a gratifying improvement in the earnings of the coal department. In the previous fiscal year the trade was greatly depressed, prices often being below the cost of production, and as a result the coal operations, after paying the rental, showed a slight loss. In the late fiscal year trade conditions were much improved, the market being good, with prices firm for both coal and coke. In consequence thereof, there was a clear profit, after paying the yearly rental, of \$101,845.

Total Results—The profit of the coal department, together with the income of \$27,481 from other sources, added to the profit from railway operations, gives the result of \$526,155 applicable to fixed charges, and leaves, after payment of the same, a net surplus of \$216,416, being an increase of \$154,662 over 1911-12.

Improvements, Etc.—There was expended for betterments, heavier rails, side tracks, ballasting, etc., \$43,666; betterments to equipment, \$12,043, and in additions to coalplants, \$19,628. These three items, amounting to \$75,338, deducted from the surplus of \$216,416, leaves a clear income of \$141,078, which was used in paying equipment warrants, debts, etc.

Traffic Earnings—The coal and coke tonnage has continued its steady growth and the increase in freight earnings therefrom was \$37,447. In three years the revenue from this source has increased 76%, and it is expected that it will soon reach the earnings from miscellaneous freights. As coal and coke take the lowest freight rates, they require a correspondingly larger volume of traffic to equal the miscellaneous freights in earning capacity. In the shipment of coal and coke produced on its line, the road last year exceeded for the first time a million tons, the exact amount being 1,016,690, an increase over the year before of about 20%, and nearly double the tonnage of 1910.

Coal Lands—The railroad owns about 100,000 acres of coal lands and coal-mining rights, all carefully selected within actual coal areas along its route in Randolph, Barbour, Upshur, Lewis, Gilmer and Braxton Counties, W. Va. In practically all of these coal lands the measures are above water level and the coal can be easily and economically mined by drift. Among the seams are the Pittsburgh, Sewickley, Masontown, Mahoning, Upper Freeport, Kittanning and New River seams. In addition to their steam-producing qualities, most of them are also excellent coking coals.

The railway company has also what is virtually a perpetual lease of all the properties of the Davis Colliery Co., and the latter is conducted practically as the coal department of the railway. It operates and markets the products not only from the mines on the coal lands of the railway, but on its own as well, and the profit from both sources above the rental accrues to the railway. The Davis Colliery Co. owns about 25,000 acres of coal lands and coal-mining rights in the well known Roaring Creek coal field in Randolph and Barbour Counties. It is the largest operator in that region and one of the leading mining companies of the state; its five plants are capable of producing daily 3500 tons of coal and 700 tons of coke.

In addition the Davis Colliery Co. is operating two mines in the Pittsburgh seam, on lands owned by the railway company—one at Bower and one at Copen; present output, about 800 tons and 600 tons, respectively.

There are 18 or 20 coal-mining companies on the line of the road operating some 24 mines.

Troubles of the Paint Creek Bondholders

The Paint Creek bondholders' meeting was made interesting by those opposed to permitting the trustee to exchange \$1,250,000 Crescent Coal & Lumber 5s with 50% stock, now held in the sinking fund, for \$1,250,000 of outstanding Paint Creek, 5s, which latter bonds apparently the Lackawanna Coal & Lumber Co. interests have finally purchased or will purchase in the open market, in order to effect the exchange and release the Crescent's so that they may be canceled and at the same time automatically release \$1,250,000 Lackawanna Coal & Lumber 6s now held by the Republic Trust Co., trustee, against a like amount of Crescent's in the lumber company treasury. The entire issue of Crescent's would be canceled and the property be subject to the lien of the Lackawanna Coal & Lumber 6s outstanding, whereas the Paint Creek bonds which at the present have a pro rata interest in 40% of the Crescent's property, would lose this equity and have nothing as a compensation except that the issue would be reduced from \$3,000,000 to \$1,750,000 of outstanding bonds. The exchange was voted through by \$1,088,000 of bonds, and opposed by \$535,000 bonds, practically \$900,000 being unrepresented.—"The Commercial and Financial Chronicle."

COAL SECURITIES

William J. Hoey reports the market on various coal securities for the week ending Feb. 7, as follows:

| Stock | Bid Asked | Stock | Bid Asked |
|--------------------------------|-----------|---------------------------------|-----------|
| American Coal..... | 80 100 | Jef. & Cle'fd. C. & I. Pfd... | 70 80 |
| American Coal Products..... | 83 84 | Kentucky Block Cannel... | 40 60 |
| Amer. Coal Prod. Pfd. | 104 106 | Lehigh Valley Coal Sales.. | 185 195 |
| Big Muddy Coal & Iron.... | 75 100 | Leh. & Wilkes-Bar. C. Co. | 310 300 |
| Burns Bros. | 50 53 | Mahoning Coal R. R. | 700 750 |
| Burns Bros. Pfd. | 94 99 | Mahoning Investment..... | 64 70 |
| By-Products Coke..... | 112 120 | Maryland Coal of Md. | 3 6 |
| Central Coal & Coke..... | 80 86 | Maryland Coal of W. Va. | 7 9 |
| Central Coal & Coke Pfd. | 78 86 | Maryland Coal of W. Va. | 7 9 |
| Chicago Lumber & Coal. | 45 55 | (5% Bonds)..... | 54 62 |
| Chicago Wil. & Ver. Coal. | 25 32 | Midland Coal..... | 80 80 |
| Colo. Fuel & Iron Pfd. | 150 160 | N. Y. S. & W. C. Pfd. | 15 30 |
| Cumberland Corporation. | 10 14 | Pocahontas Con. Collieries. | 92 101 |
| Cumberland Corp. Pfd. | 39 44 | Pocahontas Con. Coll. Pfd. | 98 105 |
| Del. Lack. & West. Coal. | 260 270 | Texas & Pacific Coal. | 97 101 |
| Elkhorn Fuel. | 4 10 | Unite Coal of Pittsburgh. | 3 101 |
| Elkhorn Fuel Pfd. | 55 70 | Victoria Coal & Coke Pfd. | 40 80 |
| Hocking Valley Products. | 1 4 | | |

No important dividends were announced during the week.

¶

The New River Co.—Indications are that the British syndicate formed to take over the New River Co. and other West Virginia properties, means business. The alleged recent option of the New River properties provide for a payment of \$600,000 Feb. 16, the balance to be payable not later than June 30.

¶

Hocking Valley Products Co. (Earnings 1913)

| Gross Earnings | Net Earnings | Interest, Taxes & C. | Sink. Fund. Reserve & C. |
|--------------------------------------|--------------|----------------------|--------------------------|
| \$628,965 | \$198,593 | \$176,737 | \$62,693 |
| Leaving Deficit Balance of \$40,897. | | | |

The earnings of the Maryland Coal Co., of Maryland, should show a big increase this year over last, as they will begin shortly to ship coal from the new mine recently opened on their property.

¶

There is a larger demand lately for bonds of coal companies; some of the better class have made good advances in prices since Jan. 1.

¶

It is quite possible that the Colorado Fuel & Iron Co. will soon pay more of the back dividends on the preferred stock. The bid side for stock has advanced over 20 points since the latter part of 1913.

Index of Current Coal Literature

We will furnish a copy of any article (if in print) for the price quoted. Where no price is quoted, the cost is unknown. Inasmuch as the papers must be ordered from the publishers, there will be some delay for foreign papers. Remittance must be sent with order.

ACCIDENTS AND THEIR PREVENTION

Mining Accidents in 1912. Coll. Guard., Dec. 24, 1913; 13 pp. 40c.

Monthly Statement of Coal-Mine Fatalities in the United States, November, 1913, with Revised Figures for Preceding Months. Albert H. Fay. Bureau of Mines; 18 pp.

BLASTING, EXPLOSIVES

Electric Blasting in Shafts with Relay Action Exploders. C. W. Morse. Min. & Sci. Press, Jan. 31, 1914; ½ p. 20c.

Powder in Open-Cut Mining. Coal Age, Jan. 3, 1914; 1 p. illus. 10c.

Sprinkling Machine for Use During Shotfiring. (Translated from Glückauf) Coll. Guard., Jan. 16, 1914; ½ p. illus. 40c.

The Use and Abuse of Explosives in Coal Mining. J. J. Rutledge, with preface by J. A. Holmes. Bureau of Mines, Miners' Circular 7; 44 ½ pp., illus.

Tests of Permissible Explosives. Clarence Hall and Spencer P. Howell. Bureau of Mines, Bull. 66; 307 pp., illus.

BORING AND TUNNELING

The Modern Rock Drill. (Extract from paper of W. L. Saunders presented before the Butte meeting of the A. I. M. E.) Can. Min. Jour., Jan. 1, 1914; 2 ½ pp. 20c.

The Younger Generation of Rock Drills. Chas. Hirschberg. Min. & Eng. Wld., Jan. 31, 1914; 2 pp., illus. 20c.

BRIQUETTES

Briquetting in North America. C. T. Malcolmson. Coal Age, Jan. 10, 1914; 1 p. 10c.

Production of Coke and Briquettes in 1912. (From Part III of the General Report on Mines and Quarries.) Coll. Guard., Jan. 16, 1914; 3 p. 40c.

COAL DUST

Austrian Coal Dust Experiments. Fourth Report. (Translated from Oest. Zeit. f. B. u. H.) Coll. Guard., Jan. 16, 1914; 2 pp., illus. 40c.

Dust-Collecting Plant at Brackley Colliery. Iron Coal Tr. Rev., Jan. 16, 1914; ½ p. illus. 40c.

The Transition from Inflammation to Explosion of Coal Dust. Coal Age, Jan. 31, 1914; 4 pp., illus. 10c.

COKE

Coke Making in China. Min. & Sci. Press, Dec. 27, 1913; 1 p., illus. 20c.

Correlation of the Gas Lighting and Coke Oven Industries. (Lecture by J. E. Christopher.) Gas Wld., Jan. 17, 1914; 5 pp., illus. 40c.

Increased Use of Prepared Coke. F. C. Atwell. Coal Dealer, January, 1914; ¾ p. 20c.

The Automatic Control of Byproduct Coke-Oven Plants—II. A. Thau. Gas Wld., Jan. 3, 1914; 1 ½ pp., illus. 40c.

Types of Coke-Oven Plants as Seen in Operation—VII. (Semet-Solvay Installation at Normanby Park Steelworks.) Gas Wld., Jan. 3, 1914; 6 pp., illus. 40c.

COMPRESSED AIR

Air Compressors and Compressed-Air Machinery. (Chapter V on large compressed-air engines and mining machinery.) Robt. L. Streeter. Min. Mag., January, 1914; 18 ½ pp., illus. 35c.

Air Compressor Testing. W. C. Lancaster. Power, Jan. 4, 1914; 3 ½ pp., illus. 15c.

Moisture in Compressed Air. A. Hofmann. Power, Jan. 13, 1914; 2 pp., illus. 15c.

Sullivan Angle-Compound Power-Driven Air Compressor. Coal Tr. Bull., Jan. 2, 1914; 4 ½ pp., illus. 25c.

The Testing of Air Compressors. H. Keay Pratt. Coll. Guard., Jan. 9 and 16, 1914; 3 ½ pp., illus. 80c.

DRAINAGE, PUMPING, ETC.

Deep Mine Pumping and Air Lifts. A. H. Chodzko. Min. & Sci. Press, Jan. 17, 1914; 4 pp., illus. 20c.

Mine Drainage by Compressed Air. A. D. Spears. Coal Age, Jan. 17, 1914; ¾ p., illus. 10c.

The Oneida No. 2 Anthracite Drainage Tunnel. M. C. Reed. Mine & Quarry, January, 1914; 2 ½ pp., illus.

ELECTRICITY

Choice of Electrical Machinery for Use in Mines, with Discussion. (Paper by J. P. C. Kivlen read at A. M. E. E., West of Scotland Branch.) Iron Coal Tr. Rev., Jan. 2, 1914; 2 ½ pp., 40c.

Maintenance of Mining Electrical Plant. (Paper by C. C. Reid read before the East of Scotland Branch of the A. M. E. E., Nov. 14, 1913.) Iron Coal Tr. Rev., Dec. 26, 1913; 3 p., 40c.

EXPLOSIONS

Dawson, New Mexico, Mine Disaster. Coll. Engr., January, 1914; 2 ½ pp., illus. 35c.

Notes on the Prevention of Dust and Gas Explosions in Coal Mines. Geo. S. Rice. Bureau of Mines, Tech. Paper 56; 17 ½ pp.

Prevention of Gas or Dust Explosions. (Paper by J. R. Booth read at the fourth annual Safety Boosting dinner of U. S. Coal & Coke Co., Jan. 10, 1914.) Coal & Coke Op., Jan. 29, 1914; ½ p., 20c.

Rock Castle Mine Explosion. Coal Age, Jan. 24, 1914; 1 ½ pp., illus. 10c.

The Dawson Mine Explosion. Coal Age, Jan. 3, 1914; ¾ p., 10c.

The Senghenydd Disaster. (Inquiry conducted by the Home Office.) Coll. Guard., Jan. 9, 1914; 2 pp., 40c.

Testing for Firedamp with Wire Loop. Henry Briggs. Coll. Engr., January, 1914; 2 ½ pp., illus. 35c.

FUEL TESTING

A Float and Sink Test Diagram. Coal Age, Jan. 31, 1914; 1 p., illus. 10c.

Varieties and Properties of Coal. Min. Eng., January, 1914; 2 ½ pp., 40c.

Work of the Birmingham Coal-Testing Plant. (Paper by E. W. Smith and G. C. Pearson read before the Midland Jr. Gas Assn.) Gas Wld., Dec. 20, 1913; 2 ½ pp., illus. 40c.

GENERAL

American Coal Mining at 80 Degrees North. C. A. Tupper. Coal Age, Jan. 24, 1914; 4 ½ pp., illus. 10c.

A New Mining Theodolite. Iron Coal Tr. Rev., Jan. 9, 1914; ½ p., illus. 40c.

A Résumé of the Coal Trade of Nova Scotia in 1913. F. W. Gray. Can. Min. Jour., Jan. 15, 1914; 4 ½ pp., 25c.

American Mining Industry and Its Future Prospects. Horace V. Winchell. Eng. Mag., February, 1914; 5 pp., 35c.

A Modern Coal Mine and Its Equipment. Geo. M. Crawford. Mine & Quarry, January, 1914; 12 pp., illus.

Coal Mining History of Muhlenberg County, Ky. (Paper read before Otto A. Rothert before the Ky. Min. Inst., Dec. 3, 1913.) Coal Age, Jan. 3, 1914; 1 ½ pp., 10c.

Coal Markets and Business Aspects of the Fuel Industry in 1913. A. T. Shurick. Coal Age, Jan. 10, 1914; 5 pp., 10c.

Efficiency in and About the Mines. John F. Bevan. Penn. State Min. Quart., January, 1914; 6 ½ pp., 35c.

Output and Value of Coal in 1912. (From Part III of the General Report on Mines and Quarries for 1912 by R. A. S. Redmayne, H. M. Chief Insp. of Mines.) Coll. Guard., Jan. 9, 1914; 1 ½ pp., 40c.

Present Conditions in the Coal Fields of Mexico. Coal Age, Jan. 10, 1914; 1 ½ pp., illus. 10c.

Review of the Export Coal Trade in 1913. F. R. Wadleigh. Coal Age, Jan. 10, 1914; 1 ½ pp., 10c.

The English Coal Trade of 1913. Coll. Guard., Jan. 2, 1914; 10 pp. 40c.

The Production of Coal and Coke in Canada During the Calendar Year 1912. John McLeish. Can. Dept. of Mines, Mines Branch; 37 pp.

To Increase Yield of Motor Fuel from Coal. Iron Age, Jan. 29, 1914; ½ p. 30c.

The History of Anthracite in Its Earliest Days. Coal Tr. Jour., Jan. 28, 1914; 2 pp., illus. 35c.

The Origin of Coal. W. G. Burroughs. Coll. Engr., January, 1914; 2½ pp. (Continued from December.) 35c.

GEOLOGY

Geology and Fossil Flora of the Kent Coal Field. (Communication from Dr. E. A. Newell Arber read at meeting of Geol. Soc. of London, Dec. 3, 1913.) Iron Coal Tr. Rev., Dec. 19, 1913; ½ p. 40c.

Prospecting Bering River Coal Field. (Describes the methods required by the nature of the country, which is rough and mountainous.) W. R. Crane. Coll. Engr., January, 1914; 3½ pp., illus. 35c.

HOISTING AND HAULAGE

Automatic Gong for Underground Motor. Eng. & Min. Jour., Jan. 3, 1914; ¼ p., illus. 25c.

Electric Mine Haulage. E. A. Lof. Coll. Engr., January, 1914; 5½ pp. (Concluded from December.) 35c.

Electric Winding. (Paper by James Gillespie read before the East Scotland Branch of A. M. E. E.) Iron Coal Tr. Rev., Jan. 9, 1914; 1½ pp., illus. 40c.

Installing Electrical Haulage in Longwall Mines. Black Diamond, Jan. 3, 1914; 1½ pp., illus. 20c.

Mechanical Haulage System in Coal Mines. (Paper by R. W. Stuler prepared for reading at the Coal Min. Inst. of Amer. Dec. 4.) Coal & Coke Op., Jan. 1, 1914; 2½ pp., illus. 20c.

LEGAL REFERENCES

Change in Alberta Mining Laws. Norman Fraser. Coll. Engr., January, 1914; ½ p. 35c.

When Is a Coal Yard a Nuisance? A. L. H. Street. Coal Age, Jan. 3, 1914; 1 p. 10c.

When Does a Labor Union Become an Unlawful Combination? A. L. H. Street. Coal Age, Jan. 10, 1914; 1 p. 10c.

Revision of the Mining Law. Grafton Mason. Min. & Sci. Press, Jan. 10, 1914; 2½ pp. 20c.

Trade Unions and the Law. (From The Survey.) H. R. Seager. Coal Age, Jan. 17, 1914; 1½ pp. 10c.

LIGHTING

Efficiency of Portable Electric Mine Lamps. (Final part of paper read by H. H. Clark at the Dec. 5, 1913, meeting of the Coal Min. Inst. of Amer.) Coal Age, Jan. 3, 1914; 2½ pp., illus. 10c.

Testing of Safety Lamps. (From Part II of the Mines and Quarries General Report.) Iron Coal Tr. Rev., Dec. 26, 1913; 1½ pp. 40c.

MINE FIRES

Spontaneous Combustion in Coal Mines. (Continuation of evidence before the Departmental Committee.) Iron Coal Tr. Rev., Dec. 25, 1913, Jan. 2, 9, 16 and 23, 1914; 8 pp., illus. \$1.20.

Two Underground Fires at a Colliery in Raniganj Coal Field. C. H. McCale. Trans. Min. & Geol. Inst. of India, Vol. VII; 29 pp., 2 pl.

PREPARATION

Coal Washing in Illinois. F. C. Lincoln. Univ. of Ill. Bull. No. 69; 103 pp., illus. 60c.

Mining at Lowe, West Virginia. (Describes new method of coal cutting and modern tipple of the Weyanoke Coal & Coke Co.) Wm. Z. Price. Coll. Engr., February, 1914; 2 pp., illus. 35c.

RESCUE, SAFETY APPARATUS

A New Safety Catch. Coll. Guard., Dec. 24, 1913; ½ p., illus. 40c.

German Rescue Organization. (Translated from Glückauf. Describes the use and care of breathing apparatus at the Clausthal Central Station.) Coll. Engr., January, 1914; 2½ pp. 35c.

Important Report on Rescue Apparatus. (Report of Dr. J. S. Haldane to the Doncaster Coalowners' Association on self-contained rescue apparatus for use in irrespirable atmospheres.) Coll. Guard., Jan. 23, 1914; 2½ pp. 40c.

Oxygen Breathing Apparatus. F. W. Gray. Can. Min. Jour., Jan. 1, 1914; 1½ pp. 20c.

Right and Wrong Rescue Apparatus. John A. Menaugh. Coal & Coke Op., Jan. 22, 1914; 1½ pp., illus. 20c.

The Draeger Self-Rescue Apparatus. (This apparatus is designed on light and compact lines, weighs 7 lb. and when folded up measures 11x7 in.) Iron Coal Tr. Rev., Jan. 9, 1914; ½ p., illus. 40c.

SANITATION, DISEASES

Commission of Resuscitation from Electric Shock Recommends Meltzer Apparatus. (Read before the Natl. Elec. Light Assn. Convention, June, 1913.) Coal Tr. Bull., Jan. 15, 1914; 2½ pp. 25c.

Pithead Baths at the Atherton Collieries, Lancashire, England. (A model installation containing some new features.) Coll. Guard., Jan. 2, 1914; 2 pp., illus. 40c.

The Mount Pleasant Bath House of the Scranton Coal Co. Coll. Engr., January, 1914; ¾ p., illus. 35c.

STEAM ENGINES AND BOILERS

Coal and Ash Handling at Pierce-Arrow Plant. Chas. H. Bromley. Power, Jan. 13, 1914; 3½ pp., illus. 15c.

The Clinkering of Coal and Its Composition. (Paper read by Oscar W. Palmemberg before the Society of Chemical Industry.) Iron Age, Feb. 5, 1914; 1½ pp. 30c.

The Use of Pulverized Coal in Metallurgical Furnaces. (Discussion of Mr. Lord's paper read before the Engrs. Soc. of Western Penn., Sept. 30, 1913.) E. W. Shinn. Coal & Coke Op., Jan. 1, 1914; 2½ pp. 20c.

The Dunn Pulverized Coal Burner. G. A. Roush. Metall. & Chem. Eng., January, 1914; 1½ pp., illus. 35c.

SHAFTS, SHAFT SINKING

Cementation in Shaft Sinking. Coal Age, Jan. 24, 1914; 2½ pp., illus. 10c.

Shaft Sinking Below Low-Water Mark. (Abstract of the annual report of Mr. Walker, Inspector for the Scotland District.) Min. Eng., January, 1914; 1½ pp., illus. 40c.

SIGNALING

A Wireless System of Telephony for Coal Mines. Coal Age, Jan. 31, 1914; illus. 10c.

TRANSPORTATION

A New Dirt Dip. (A simple and inexpensive arrangement of tipping gear.) Iron Coal Tr. Rev., Jan. 2, 1914; ½ p., illus. 40c.

Some Notes on the Interior Water Movement of Coal. Coal Age, Jan. 3, 1914; 1½ pp., illus. 10c.

Transportation and handling of Alaskan Coal. W. R. Crane. Penn State Min. Quart., January, 1914; 16 pp.; illus. 35c.

Using Canals to Carry Eastern Coal. Black Diamond, Jan. 31, 1914; ½ p., illus. 20c.

TIMBERING, PACKING, ETC.

New Method of Making Large Arches in Mines. (Abstract of paper by John Roberts read before the So. Wales Inst. of Engrs.) Iron Coal Tr. Rev., Jan. 23, 1914; 1 p., illus. 40c.

Slushing. Edw. J. Kelley. Penn. State Min. Quart., January, 1914; 3½ pp. 35c.

Underground Concrete Protective Work in Illinois Mines. G. E. Lyman. Coal Age, Jan. 17, 1914; 3½ pp., illus. 10c.

VENTILATION

Ventilation of Mines With a View to Eliminating Accidents. (Address of A. G. Hahn at the fourth annual Safety Boosting dinner of U. S. Coal & Coke Co., Jan. 10, 1914.) Coal & Coke Op., Jan. 29, 1914; ½ p. 20c.

WORKING OF MINERALS

Machine Mining vs. Shooting Off the Solid. (Paper by Wm. Abrams read before the Mine Managers of Dist. 2, Des Moines, Ia., Dec. 7, 1913.) Coal & Coke Op., Jan. 8, 1914; 1½ pp. 20c.

Methods of Working in County Durham. Wm. Cummings. Min. Eng., January, 1914; 1 p., illus. 40c.

Mining Methods for Maximum Coal Recovery. (Paper by Wm. H. Grady read before the winter meeting of the W. Va. Coal Min. Inst.) Black Diamond, Jan. 10, 1914; 3½ pp., illus. 20c.

The Furnace Run Mines. (A description of the equipment of two mines, worked on the room-and-pillar system, of the Allegheny River Min. Co., near Kittanning, Penn.) Wm. Z. Price. Coll. Engr., January, 1914; 4½ pp., illus. 35c.

Working a Steep Coal Seam. S. H. Ash. Coal Age, Jan. 3, 1914; 2½ pp., illus. 10c.